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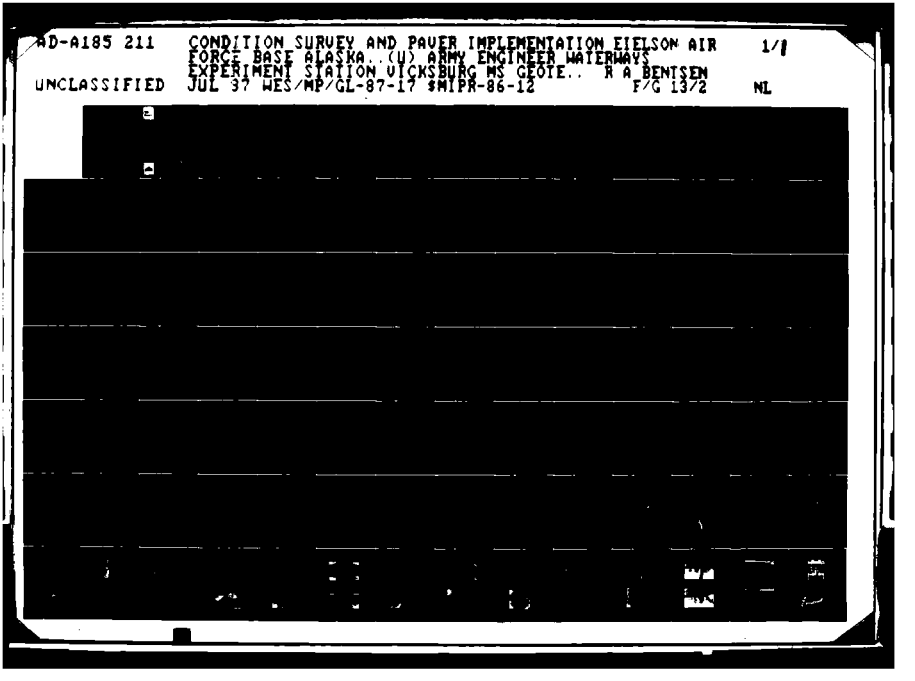

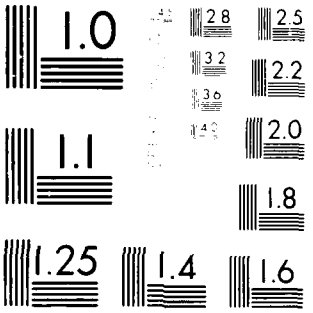

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CONDITION SURVEY AND PAVER IMPLEMENTATION EIELSON AIR FORCE BASE, ALASKA

by

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Geotechnical Laboratory

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19 ABSTRACT (Continue on reverse if necessary and identify by block number)

A pavement condition survey was performed at Eielson Air Force Base, Alaska, in August 1986 for the purpose of determining the pavement condition index of the airfield features and for performing the initial implementation of the PAVER pavement management system.

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PREFACE

The condition survey described in this report was requested by Military Interdepartmental Purchase Request (MIPR) No. 86-12 dated 4 March 1986 from the Base Civil Engineer, Eielson Air Force Base, Alaska, to the US Army Engineer Waterways Experiment Station (WES), Vicksburg, Miss.

The condition survey at Eielson Air Force Base, Alaska, was performed by a WES condition survey team during the period 11-21 August 1986. The team consisted of Messrs. R. A. Bentsen, W. P. Grogan, P. S. McCaffrey, and D. D. Mathews, Pavement Systems Division (PSD), Geotechnical Laboratory (GL). This report was prepared by Mr. Bentsen under the supervision of Messrs. R. W. Grau, Chief, Prototype Testing and Evaluation Unit, PSD; J. W. Hall, Jr., Chief, Engineering Investigations, Testing, and Validation Group, PSD; and H. H. Ulery, Jr., Chief, PSD. The work was under the general supervision of Dr. W. F. Marcuson III, Chief, GL, WES. Ms. Odell F. Allen, Information Products Division, Information Technology Laboratory, edited the report.

COL Dwayne G. Lee, CE, is the Commander and Director. Dr. Robert W. Whalin is Technical Director.

CONTENTS

CONVERSION FACTORS, NON-SI TO SI (METRIC)
UNITS OF MEASUREMENT

Non-SI units of measurement used in this report can be converted to SI (metric) units as follows:

Multiply	By	To Obtain
feet	0.3048	metres
inches	2.54	centimetres
square feet	0.09290304	square metres
square yards	0.8361274	square metres

CONDITION SURVEY AND PAVER IMPLEMENTATION, EIELSON AIR FORCE BASE, ALASKA

PART I: INTRODUCTION

Background

1. This report describes the condition survey of the airfield pavements at Eielson Air Force Base (AFB), Alaska, and the initial implementation of PAVER, a pavement management system. The implementation was performed to provide base engineers with the initial data base required for making pavement management decisions concerning costs and maintenance requirements. The condition survey was performed by the US Army Engineer Waterways Experiment Station (WES) during the period 11-21 August 1986.

Objective and Scope

2. The overall objective of this project was to determine the pavement condition of the airfield pavements at Eielson AFB and to input the information into a PAVER data base to provide the base engineers with a permanent data base to use for future pavement management decisions. This objective was accomplished by:

a. Performing a condition survey of the pavements in accordance with AFR 93-5 (Headquarters, Department of the Air Force 1981).*

b. Inputting the pavement network and condition survey information into PAVER to calculate a pavement condition index (PCI) of each of the pavement features.

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* Headquarters, Department of the Air Force. 1981. "Airfield Pavement Evaluation Program," Air Force Regulation AFR 93-5, Washington, DC.

c. Completing the data base implementation by compiling pavement construction data and inputting the information into the PAVER data base.

d. Producing detailed drawings of the pavement features to ensure that future condition surveys will be performed at the same locations as the one performed for this report.

PART II: PAVEMENT CONDITION SURVEY

Introduction

3. A pavement condition survey is performed to determine the present surface condition of the various pavement features on an airfield. The procedure used in performing the condition survey was developed by the US Army Corps of Engineers and has been accepted as a regulation by the US Air Force (Headquarters, Department of the Air Force 1981).* A knowledge of the condition survey procedures discussed in AFR 93-5 is required for the use and understanding of this report.

Pavement Definition and Identification

4. The pavement network is divided into three specific units in order to manage the pavement network effectively. The three units of division are the feature, the section, and the sample unit. The method for dividing the pavement network is discussed in detail in AFR 93-5 and is briefly discussed herein.

5. Airfield pavement features, also known as branches, are defined by various parameters such as the pavement type, construction history, and pavement usage. The feature designations used for the condition survey of Eielson AFB were established in the "Airfield Pavement Evaluation Report, Eielson AFB, Alaska," published in February 1982 by the US Air Force Engineering and Services Center, Tyndall AFB, Florida. These features have been so designated under strict guidelines, and any changes to them should

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* Headquarters, Department of the Air Force. 1981. "Airfield Pavement Evaluation Program," Air Force Regulation AFR 93-5, Washington, DC.

be highly justified. Locating the features on the airfield itself is necessary before the performance of the condition survey can proceed. Three apron additions were constructed since the publishing of the evaluation report, and those features were numbered sequentially from the last apron feature in the report. Figure 1 gives a layout of the airfield pavements at Eielson AFB and the pavement features contained within it.

6. After each pavement feature has been defined, further division of the feature may be required for reasons such as traffic flow. The further division of features is done into sections. For instance, a runway feature may be 150 ft* wide, but the majority of the traffic occurs in the middle of the feature. Therefore, a section is defined in the center of the feature with additional sections defined on either side of the middle section. Also, an apron may contain taxi lanes which the aircraft follow to their parking locations, a section which would differ from the areas not constantly trafficked by aircraft. Note that if a feature requires no division, for definition purposes it is still considered to contain one section.

7. After the pavement section definition has been completed, the section is divided into sample units, which are conveniently sized areas of pavement on which the inspection is performed. A sample unit on asphaltic concrete (AC) pavement is a 5,000-sq-ft area, and a sample unit on portland cement concrete (PCC) pavement consists of 20 slabs. A pavement section is divided into sample units for condition survey purposes only. Recognizing that not all sample units can be 5,000 sq ft or 20 slabs, deviations of 50 percent on either side of these values are allowed for survey purposes.

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* A table of factors for converting non-SI units of measurement to SI (metric) units is presented on page 3.

8. When a section has been divided into sample units, it has been properly prepared for the survey. Inspection of all of the sample units within a section could require a considerable amount of time. Therefore, the random sampling method was developed to provide an adequate calculation of the PCI while inspecting only a portion of the sample units in a section. The method, further defined in AFR 93-5, allows for a reduction in the number of sample units surveyed without a significant loss of accuracy in the calculation of the PCI. It should be noted, however, that the inspection of all the sample units may be necessary for estimation of maintenance and repair work.

9. An essential concept in pavement management is determining the deterioration of the pavement surface over time. The PCI is used in the PAVER system to determine this deterioration. Determining the PCI of a pavement section at different time intervals requires that the same sample units of the section be surveyed to get a precise idea of the deterioration rate. Drawings of each of the pavement features and any section divisions have been included in this report to illustrate the sample units within each feature to ensure that future condition surveys are conducted at these same locations. The locations of the sample units on the runway and most of the taxiways were made using stationing. The starting location and direction of the stationing are illustrated in Figure 2, and the sample units tested are tabulated in Table 1. Further definition of the sample units surveyed on the runway is illustrated in Figures 3 and 4. The remainder of the taxiway sections and all of the apron sections were laid out to accommodate the sample unit size definitions as illustrated in Figures 5 through 18.

Pavement Inspection

10. The performance of a condition survey consists of inspecting the pavement surface for various types of distresses, determining the severity of each distress found, and measuring the amount of distress within the sample unit. Distresses on AC pavement are measured in either linear feet or square feet within the sample unit, and those on PCC pavement are measured by counting the number of slabs affected within the sample unit.

11. The product of the condition survey is the PCI of the sample unit. The PCI is a value from 0 to 100 (worst to best, respectively) of the surface condition of the pavement. The PCI is obtained by determining a deduct value for the amount of each of the distress types and severities found in the inspection, determining a corrected deduct value for the combined effect of various distresses on the pavement condition, and subtracting the corrected deduct value from 100. A pavement with no distress has a PCI of 100 with varying amounts of distress decreasing the PCI value to a possible low of 0. Pavement condition ratings (excellent to failed) are assigned to different levels of PCI values. These ratings and their respective PCI value definitions are shown in Figure 19. The PCI of the pavement section is calculated by averaging the PCI's of the sample units surveyed.

12. The majority of the pavement features at Eielson AFB are rated from fair to very good condition with some features rated excellent and some rated from poor to very poor. Figure 20 illustrates the condition ratings of the features at Eielson AFB, and Table 2 describes the more prominent distresses observed in the features. Photos 1 through 34 show various distresses that were observed on the airfield pavements.

PART III: PAVER DATA BASE IMPLEMENTATION

13. The use of the PAVER system requires knowledge of both computers and the PAVER system itself. This report does not describe the operation of a computer; however, it does outline the necessary PAVER procedures in moderate detail. The "PAVER User's Guide" by M. Y. Shahin, ADP-356-1,* goes into specific detail of all the procedures for setting up and using a PAVER data base, and it should be used as a reference when performing operations in the PAVER system.

14. The PAVER system consists of five different system functions: data entry, system sign-on, data base update, report generation, and data analysis. Performing each function requires the use of specific programs, files, and procedures. Data entry, system sign-on, and data analysis do not directly interact with the PAVER data base, but data base update and report generation require data base interaction.

Data Entry

15. The pavement network data are entered into the PAVER data base in a logical order that defines the features and sections first. The additional information is then entered that allows the user to perform data base related operations such as PCI calculation and report generation. The data must be in specific formats for it to be accepted by the data base. Three data input programs are used to prepare data into the specific formats: PAVERIN, EDITOR, and REFORMT. All of these programs have been written in the BASIC computer language and are operable on a personal computer that

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* US Army Construction Engineering Research Laboratory and US Army Facilities Engineering Support Agency 1985.

contains a BASIC system. The PAVERIN program is used to input the data into the correct formats, the EDITOR program is used for editing any errors that may have been placed in the data, and the REFORMT program is used to prepare the data for uploading onto the mainframe computer.

16. The two ways to collect the condition survey data in the field are by recording the data manually on condition survey data sheets and later placing the data into PAVER format using the PAVERIN data input program, or by inputting the data directly into the FIELD program on a portable computer. The FIELD program places the data into PAVER format as the data are entered into the computer and saves the data in a file that can be directly uploaded to the mainframe computer. The data for Eielson AFB were collected using a portable computer.

17. The data for physical properties and construction history of the pavements at Eielson AFB were obtained from the 1983 evaluation report and from base engineering personnel. The physical property data, as the data were entered into the data base, are contained in Table 3.

System Sign-On

18. The mainframe PAVER system currently resides on a Control Data Corporation (CDC) computer and is accessible through a remote terminal via a telephone link. The telephone link is achieved by using a modem and appropriate communication software. Connection to the system requires dialing the CDC computer for connection and then entering the appropriate access codes to sign-on to the computer. The access codes (user ID, password, and charge number) are obtained when a charge account has been set up with CDC.

Data Upload and Data Base Update

19. Data are added to the data base either interactively or by using the BATCH method. The interactive method is used when the user is on-line to the CDC computer. This method is easier to perform but is more expensive. The BATCH method involves transferring the data file created with the PAVERIN or FIELD programs from the personal computer to the CDC mainframe. Using either operation involves creating the file DATAFL on the CDC computer from which the data are read into the data base. After DATAFL is prepared, the PAVER system checks it for errors, and after corrections have been made, the data are loaded into the data base.

Report Generation and Data Analysis

20. The PAVER system generates reports that provide a summary or specific information based on the data stored in the mainframe data base. It also calculates information such as budget needs from data and analysis programs provided by PAVER. These reports can be generated either interactively or through a BATCH process as listed in Table 4. The BATCH process produces the report when the user is not signed-on to the CDC computer and is more cost-effective when generating large amounts of information. The interactive process, performed while the user is signed-on, can be used effectively when generating smaller reports and detecting data base errors.

21. There are two types of data analysis programs in the PAVER system: those that access the data base and those that do not access the data base. These programs are listed in Table 5. The difference in the two types is that the data base must be on line for the report to operate. The user responds to questions that the program asks, and then analysis results are

produced based on those responses. The analysis reports can only be generated using the interactive process.

Table 1

Sample Unit Identification, Eielson Air Force Base

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
R1A	1	2	1+00	2+00	5,000
		3	2+00	3+00	5,000
		5	4+00	5+00	5,000
		7	6+00	7+00	5,000
		8	7+00	8+00	5,000
		10	9+00	10+00	5,000
	2	1	0+00	1+00	5,000
		3	2+00	3+00	5,000
		4	3+00	4+00	5,000
		6	5+00	6+00	5,000
		8	7+00	8+00	5,000
		10	9+00	10+00	5,000
	3	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		4	3+00	4+00	5,000
		5	4+00	5+00	5,000
		8	7+00	8+00	5,000
		9	8+00	9+00	5,000
	4	1	0+00	1+00	7,500
		2	1+00	2+00	7,500
		3	2+00	3+00	7,500
		4	3+00	4+00	7,500
		5	4+00	5+00	7,500
R2D	1	3	6+75	7+50	5,625
		7	9+75	10+50	5,625
		12	13+50	14+25	5,625
		16	16+50	17+25	5,625
		20	19+50	20+25	5,625
		24	22+50	23+25	5,625
		29	26+25	27+00	5,625
		33	29+25	30+00	5,625
		38	33+00	33+75	5,625
		43	41+25	42+00	5,625
		47	44+25	45+00	5,625
		51	47+25	48+00	5,625

Continued

Table 1 (Continued)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
R2D (Cont.)	2	3	1+50	2+25	5,625
		8	5+25	6+00	5,625
		13	9+00	9+75	5,625
	3	19	13+50	14+25	5,625
		24	17+25	18+00	5,625
		29	21+00	21+75	5,625
		36	26+25	27+00	5,625
		41	30+00	30+75	5,625
		46	33+75	34+50	5,625
		50	36+75	37+50	5,625
		55	40+50	41+25	5,625
		60	44+25	45+00	5,625
		63	46+50	47+25	5,625
R3C	1	12	11+00	12+00	5,000
		15	14+00	15+00	5,000
		19	18+00	19+00	5,000
		23	22+00	23+00	5,000
		26	25+00	26+00	5,000
		29	28+00	29+00	5,000
		32	31+00	32+00	5,000
		37	36+00	37+00	5,000
		40	39+00	40+00	5,000
		44	43+00	44+00	5,000
		48	47+00	48+00	5,000
	2	13	12+00	13+00	5,000
		16	15+00	16+00	5,000
		20	19+00	20+00	5,000
		24	23+00	24+00	5,000
		27	26+00	27+00	5,000
		30	29+00	30+00	5,000
		35	34+00	35+00	5,000
		38	37+00	38+00	5,000
		41	40+00	41+00	5,000
		45	44+00	45+00	5,000
		47	46+00	47+00	5,000
	3	11	10+00	11+00	5,000
		14	13+00	14+00	5,000
		17	16+00	17+00	5,000
		21	20+00	21+00	5,000

Continued

Table 1 (Continued)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
R3C (Cont.)	3	25	24+00	25+00	5,000
		28	27+00	28+00	5,000
		31	30+00	31+00	5,000
		36	35+00	36+00	5,000
		39	38+00	39+00	5,000
		43	42+00	43+00	5,000
		46	45+00	46+00	5,000
R4C	1	50	49+00	50+00	5,000
		52	51+00	52+00	5,000
		55	54+00	55+00	5,000
		57	56+00	57+00	5,000
		59	58+00	59+00	5,000
		60	59+00	60+00	5,000
		63	62+00	63+00	5,000
		65	64+00	65+00	5,000
	2	51	50+00	51+00	5,000
		53	52+00	53+00	5,000
		56	55+00	56+00	5,000
		58	57+00	58+00	5,000
		60	59+00	60+00	5,000
		62	61+00	62+00	5,000
		64	63+00	64+00	5,000
		66	65+00	66+00	5,000
	3	51	50+00	51+00	5,000
		54	53+00	54+00	5,000
		57	56+00	57+00	5,000
		59	58+00	59+00	5,000
		61	60+00	61+00	5,000
		63	62+00	63+00	5,000
		65	64+00	65+00	5,000
		67	66+00	67+00	5,000
R5D	1	2	49+75	50+50	5,625
		5	52+00	52+75	5,625
		8	54+25	55+00	5,625
		12	57+25	58+00	5,625
		15	59+50	60+25	5,625
		18	61+75	62+50	5,625
		22	64+75	65+50	5,625
		25	67+00	67+75	5,625

Continued

Table 1 (Continued)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
R5D (Cont.)	1	28	69+25	70+00	5,625
		32	72+25	70+00	5,625
		35	74+50	75+25	5,625
	2	4	51+25	52+00	5,625
		8	54+25	55+00	5,625
		11	56+50	57+25	5,625
		15	59+50	60+25	5,625
		19	62+50	63+25	5,625
		23	65+50	66+25	5,625
		28	69+25	70+00	5,625
		32	72+25	73+00	5,625
		36	75+25	76+00	5,625
		40	78+25	79+00	5,625
		42	79+75	80+50	5,625
		44	81+25	82+00	5,625
R6C	1	69	68+00	69+00	5,000
		71	70+00	71+00	5,000
		72	71+00	72+00	5,000
		74	73+00	74+00	5,000
		76	75+00	76+00	5,000
		78	77+00	78+00	5,000
		80	79+00	80+00	5,000
		82	81+00	82+00	5,000
	2	70	69+00	70+00	5,000
		72	71+00	72+00	5,000
		73	72+00	73+00	5,000
		75	74+00	75+00	5,000
		77	76+00	77+00	5,000
		78	77+00	78+00	5,000
		80	79+00	80+00	5,000
		82	81+00	82+00	5,000
	3	69	68+00	69+00	5,000
		71	70+00	71+00	5,000
		73	72+00	73+00	5,000
		74	73+00	74+00	5,000
		77	76+00	77+00	5,000
		78	77+00	78+00	5,000
		80	79+00	80+00	5,000
		81	80+00	81+00	5,000

Continued

Table 1 (Continued)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
R6C (Cont.)	4	78	77+00	78+00	7,500
		79	78+00	79+00	7,500
		81	80+00	81+00	7,500
		82	81+00	82+00	7,500
		83	82+00	83+00	7,500
R7C	1	85	84+00	85+00	5,000
		86	85+00	86+00	5,000
		87	86+00	87+00	5,000
		89	88+00	89+00	5,000
		90	89+00	90+00	5,000
		91	90+00	91+00	5,000
	2	85	84+00	85+00	5,000
		87	86+00	87+00	5,000
		88	87+00	88+00	5,000
		89	88+00	89+00	5,000
		90	89+00	90+00	5,000
		91	90+00	91+00	5,000
	3	85	84+00	85+00	5,000
		86	85+00	86+00	5,000
		87	86+00	87+00	5,000
		88	87+00	88+00	5,000
		90	89+00	90+00	5,000
		91	90+00	91+00	5,000
R8C	1	94	93+00	94+00	5,000
		97	96+00	97+00	5,000
		100	99+00	100+00	5,000
		104	103+00	104+00	5,000
		108	107+00	108+00	5,000
		111	110+00	111+00	5,000
		115	114+00	115+00	5,000
		118	117+00	118+00	5,000
		121	120+00	121+00	5,000
		124	123+00	124+00	5,000
		129	128+00	129+00	5,000
		134	133+00	134+00	5,000
	2	93	92+00	93+00	5,000
		96	95+00	96+00	5,000
		99	98+00	99+00	5,000

Continued

Table 1 (Continued)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
R8C (Cont.)	2	103	102+00	103+00	5,000
		107	106+00	107+00	5,000
		113	112+00	113+00	5,000
		117	116+00	117+00	5,000
		120	119+00	120+00	5,000
		123	122+00	123+00	5,000
		127	126+00	127+00	5,000
		131	130+00	131+00	5,000
		133	132+00	133+00	5,000
	3	96	95+00	96+00	5,000
		101	100+00	101+00	5,000
		105	104+00	105+00	5,000
		109	108+00	109+00	5,000
		113	112+00	113+00	5,000
		116	115+00	116+00	5,000
		119	118+00	119+00	5,000
		122	121+00	122+00	5,000
		126	125+00	126+00	5,000
		130	129+00	130+00	5,000
		132	131+00	132+00	5,000
		135	134+00	135+00	5,000
R9A	1	136	135+00	136+00	5,000
		137	136+00	137+00	5,000
		138	137+00	138+00	5,000
		139	138+00	139+00	5,000
		140	139+00	140+00	5,000
	2	136	135+00	136+00	5,000
		137	136+00	137+00	5,000
		138	137+00	138+00	5,000
		139	138+00	139+00	5,000
		140	139+00	140+00	5,000
	3	136	135+00	136+00	5,000
		137	136+00	137+00	5,000
		138	137+00	138+00	5,000
		139	138+00	139+00	5,000
		140	139+00	140+00	5,000
R10A	1	141	140+00	141+00	5,000
		142	141+00	142+00	5,000

Continued

Table 1 (Continued)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
R10A (Cont.)	1	143	142+00	143+00	5,000
		144	143+00	144+00	5,000
		145	144+00	145+00	5,000
	2	141	140+00	141+00	5,000
		142	141+00	142+00	5,000
		143	142+00	143+00	5,000
		144	143+00	144+00	5,000
		145	144+00	145+00	5,000
	3	141	140+00	141+00	5,000
		142	141+00	142+00	5,000
		143	142+00	143+00	5,000
		144	143+00	144+00	5,000
		145	144+00	145+00	5,000
T2A	1	2	1+00	2+00	5,000
		6	5+00	6+00	5,000
		11	10+00	11+00	5,000
		15	14+00	15+00	5,000
		20	19+00	20+00	5,000
		24	19+00	20+00	5,000
		29	28+00	29+00	5,000
		33	32+00	33+00	5,000
		38	37+00	38+00	5,000
		42	41+00	42+00	5,000
		47	46+00	47+00	5,000
		51	50+00	51+00	5,000
T3C	1	1	9+75	10+75	5,000
T4C	1	1	7+75	8+75	5,000
		2	8+75	9+75	5,000
T5C	1	1	6+50	7+75	6,250
T6C	1	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		4	3+00	4+00	5,000
		5	4+00	5+00	5,000
		6	5+00	6+00	5,000

Continued

Table 1 (Continued)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
T7A	1	2	1+00	2+00	5,000
		5	4+00	5+00	5,000
		7	6+00	7+00	5,000
		9	8+00	9+00	5,000
		11	10+00	11+00	5,000
		13	12+00	13+00	5,000
		15	14+00	15+00	5,000
		17	16+00	17+00	5,000
		19	18+00	19+00	5,000
		21	20+00	21+00	5,000
T13A	1	7	6+00	7+00	5,000
		10	9+00	10+00	5,000
		14	13+00	14+00	5,000
		19	18+00	19+00	5,000
		23	22+00	23+00	5,000
		27	26+00	27+00	5,000
		32	31+00	32+00	5,000
		36	35+00	36+00	5,000
		40	39+00	40+00	5,000
		44	43+00	44+00	5,000
		49	48+00	49+00	5,000
		53	52+00	53+00	5,000
T14C	1	4	3+00	4+00	5,000
		10	9+00	10+00	5,000
		14	13+00	14+00	5,000
		20	19+00	20+00	5,000
		25	24+00	25+00	5,000
		31	30+00	31+00	5,000
		38	37+00	38+00	5,000
		39	38+00	39+00	5,000
		43	42+00	43+00	5,000
		48	47+00	48+00	5,000
		52	51+00	52+00	5,000
		55	54+00	55+00	5,000
	2	3	2+00	3+00	5,000
		7	6+00	7+00	5,000
		10	9+00	10+00	5,000
		15	14+00	15+00	5,000
		20	19+00	20+00	5,000
		25	24+00	25+00	5,000

Continued

Table 1 (Continued)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
T14C (Cont.)	2	31	30+00	31+00	5,000
		33	32+00	33+00	5,000
		37	36+00	37+00	5,000
		42	41+00	42+00	5,000
		47	46+00	47+00	5,000
		53	52+00	53+00	5,000
		56	55+00	56+00	5,000
T15C	1	1	0+90	1+90	7,500
		2	0+90	1+90	7,500
T16C	1	4	3+00	4+00	5,000
		8	7+00	8+00	5,000
		13	12+00	13+00	5,000
		18	17+00	18+00	5,000
		24	23+00	24+00	5,000
		27	26+00	27+00	5,000
		32	31+00	32+00	5,000
		36	35+00	36+00	5,000
		41	40+00	41+00	5,000
		46	45+00	46+00	5,000
		50	49+00	50+00	5,000
		54	53+00	54+00	5,000
		58	57+00	58+00	5,000
T17C	1	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		3	2+00	3+00	5,000
	2	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		3	2+00	3+00	5,000
		4	3+00	4+00	5,000
T18A	1	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		3	2+00	3+00	5,000
		5	4+00	5+00	5,000
		7	6+00	7+00	5,000
T23A	1	2	1+00	2+00	5,000
		8	7+00	8+00	5,000
		14	13+00	14+00	5,000

Continued

Table 1 (Concluded)

Feature	Section	Sample Unit	Station From	Station To	Area sq ft
T23A (Cont.)	1	17	16+00	17+00	5,000
		23	22+00	23+00	5,000
		29	28+00	29+00	5,000
		35	34+00	35+00	5,000
		41	40+00	41+00	5,000
		47	46+00	47+00	5,000
		53	52+00	53+00	5,000
		59	58+00	59+00	5,000
		65	64+00	65+00	5,000
		71	70+00	71+00	5,000
		77	76+00	77+00	5,000
	2	90	89+00	90+00	5,000
		94	93+00	94+00	5,000
		98	97+00	98+00	5,000
		102	101+00	102+00	5,000
		106	105+00	106+00	5,000
		110	109+00	110+00	5,000
		114	113+00	114+00	5,000
		126	125+00	126+00	5,000
		129	128+00	129+00	5,000
		132	131+00	132+00	5,000
T24C	3	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		3	2+00	3+00	5,000
	4	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		3	2+00	3+00	5,000
	5	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		3	2+00	3+00	5,000
	6	1	0+00	1+00	5,000
		2	1+00	2+00	5,000
		3	2+00	3+00	5,000

Table 2

Character and Condition of Airfield Facilities, Eielson AFB

Facility Name	Dimensional Area Length x Width, ft Area, sq yd	P or S*	General Comments
Runway 13-31	14,525 x 150 to 300 381,250	P	The features of the runway overlaid in 1985 are in very good condition. Low-severity longitudinal and transverse cracking, primarily caused by the reflection of cracks present in the surface under the overlay, are evident over a majority of the asphalt surface. Some of the cracking has reached medium severity. The features not overlaid in 1985 (primarily shoulder pavement) are also in very good condition. Low- and medium-severity longitudinal and transverse cracking are the only distresses present.
Main taxiway (T12A, T7A, T11A, T12C, T13A)	13,525 x varies 182,655	P and S	The asphalt-surfaced features in this facility are rated from fair to very good condition. Low- and medium-severity longitudinal and transverse cracking are prevalent throughout the facility. Distresses also present include low-severity block and alligator cracking, high-severity transverse cracking, low- and high-severity depressions, low-severity patching, bleeding, and oil spillage.

(Continued)

* P = Primary; S = Secondary.

Table 3 (Continued)

Facility Name	Dimensional Area Length x Width, ft Area, sq yd	PCI or OCI*	General Comments
Taxiway 1	varies x varies 40,850	[illegible]	The AC surface in this feature is in very good condition. Low- and medium-severity longitudinal and transverse cracking are apparent throughout along with small amounts of oil spillage and low-severity patching.
Taxiway 2	1,075 x 75 [illegible],950	[illegible]	The AC features of this taxiway are rated from fair to excellent condition. Low- and medium-severity longitudinal and transverse cracking of varying amounts are present in all of the features with T4C also exhibiting medium-severity block cracking and low-severity weathering.
[illegible]	Varies x Varies [illegible],17[illegible]	[illegible]	The AC features in this facility rated good to very good. Low- and medium-severity longitudinal and transverse cracking were evident in all the features. Oil spillage, low-severity alligator cracking, low- and medium-severity depressions, and low-severity patching were also observed.
[illegible]	[illegible] total] x 150 12,917	[illegible]	This AC facility is rated good and exhibits low- and medium-severity longitudinal and transverse cracking and low-severity patching.
[illegible]	Varies x varies 17,411	[illegible]	The asphalt features in this facility are rated from fair to very good condition. Low- and medium-severity longitudinal, transverse, and block cracking are present in the surface along with some weathering.

(Continued)

Table 2 (Continued)

Facility Name	Dimensional Area Length x Width, ft Area, sq yd	P or S*	General Comments
Taxiway 5 Holding Area	varies x varies 8,850	P	This feature is in good condition. Low- and medium-severity cracking is evident, as are some low-severity patching and jet blast damage.
Taxiway 6	5,940 x varies 195,500	S	The asphalt features in this feature rated from good to very good condition. The distresses common throughout include low- and medium-severity longitudinal cracking with random occurrences of low- and medium-severity patching, low-severity rutting, and alligator cracking, weathering, and oil spillage.
Alert Area Access Taxiways	1,120 (total) x 75 9,333	P	The sections in this feature are in good condition. Low- and medium-severity longitudinal and transverse cracking are present over the entire surface with some cracks reaching high severity and some classified as block cracking. Medium-severity patching was also present.
Refueling Loop Taxiway	13,725 x 100 152,500	P	The AC surface in this feature is in good condition. Low- and medium-severity block and longitudinal and transverse cracking are evident throughout with some of the cracking rated high severity. Infrequent instances of oil spillage and low-severity patching were also observed.

(Continued)

Table 2 (Continued)

Facility Name	Dimensional Area Length x Width, ft Area, sq yd	P or S*	General Comments
Old Nosedocks 3, 4, 5, and 6	315 x 100 each 14,000	S	Each of the sections in this feature is rated in good condition. Medium-severity longitudinal and transverse cracking, low-severity weathering, and oil spillage are the most prevalent distresses. Other low-severity distresses present are depressions, longitudinal and transverse cracking, and alligator cracking.
Nosedocks 1 and 2 AP	245 x 675 18,375	S	The concrete in this feature is in very good condition. Low-severity linear cracking is present in many slabs with some slabs considered shattered. Maintenance being conducted at the time of the survey included patching joint and corner spalls, routing and sealing cracks, and replacing the joint sealant. Other distresses present were shrinkage cracks and large patches.
AAC Hangar Apron	varies x varies 40,639	P	The tar-rubber surfaced feature in this apron is in poor condition. Longitudinal and transverse cracking of all severity levels was noted throughout with some of the cracking classified as block. High-severity weathering was evident on the surface of one of the paving lanes. The AC surfaced feature was in good condition. All severities of cracking were also noted throughout as were some oil spillage, low-severity patching, and low- and medium-severity depressions.

(Continued)

Table 2 (Continued)

Facility Name	Dimensional Area Length x Width, ft Area, sq yd	P or S*	General Comments
C-135 Apron (A4B, A5B, and A6B)	varies x varies 179,986	P and S	The recently reconstructed feature of this facility was in very good to excellent condition. Low-severity longitudinal and transverse cracking was noted in the asphalt surface. The other AC features in this facility rated from fair to good condition. Longitudinal and transverse cracking of low- and medium-severity is evident over the entire surface with some cracking classified as block and some rated as high severity. Oil spillage of fairly high quantity was observed about the parking pads with some area deteriorating into medium- and high-severity weathering.
C-135 Parking Pads	100 x 110 (each) 14,000	P	Overall, this feature is in good condition. The PCC pads have been expanded since the previous evaluation, but no construction dates or other information could be obtained. These portions of the pads have only minor distresses including low-severity joint spalls and joint seal damage. Maintenance was being performed on the original pad construction at the time of the condition survey to rout and seal cracks, replace joint sealant, and repair joint spalls. Low- and medium-severity corner breaks, all severities of shattered slabs, and low-severity linear cracks were observed in the surface of these areas.

(Continued)

Table 2 (Continued)

Facility Name	Dimensional Area Length x Width, ft Area, sq yd	P or S*	General Comments
Transient Apron (A8B and A9B)	Varies x varies 48,500	P	This facility rated from fair to good condition. Extensive longitudinal and transverse cracking of all severities was observed with some cracking classified as block and some rated high severity. Oil spillage, weathering, and depressions were also observed in the asphalt surface.
Passenger Terminal Apron	925 x 130 13,361	S	This AC feature rated in good condition. Low- and medium-severity block and longitudinal and transverse cracking were noted over the entire surface along with oil spillage and medium-severity depressions.
South Apron Area	varies x varies 123,130	P and S	The AC surface of this facility rated good. Low- and medium-severity block and longitudinal and transverse cracking were observed over the entire surface with some of the cracking rated high severity. Also noted were depressions of all severities, oil spillage, low-severity patches, and areas of weathering.
C-2 Apron	150 x 158 2,525	S	This PCC facility rated in very poor condition. Small, low-severity patches; shrinkage cracks; and high-severity joint seal damage were present in the PCC surface of this facility. Also evident were low-severity linear cracks and low-severity joint and corner spalls.

(Continued)

Table 2 (Concluded)

Facility Name	Dimensional Area Length x Width, ft Area, sq yd	P or S*	General Comments
Alert Area Apron	varies x varies 12,879	P	The PCC surface in this apron rated good. Linear cracks of all severities, high-severity joint seal damage, and low-severity, small patches were observed in the PCC surface. Also evident were low-severity, large patches, shrinkage cracks, and low-severity joint and corner spalls.
Refueling Pit Aprons (AC - A14B and A16B; PCC - A15B)	varies x varies 109,379	P	The PCC pads were in very good condition. While no distress was apparent throughout, those observed include cracks of all severities, high-severity joint seal damage, large and small patches, low- and medium-severity joint spalls, low-severity corner spalls and corner breaks, and shrinkage cracks. The asphalt features rated from fair to good condition. The surface was distressed with low- and medium-severity block and longitudinal and transverse cracking. Some cracks were high severity. Also observed were low-severity patching and rutting, low- and medium-severity depressions, and jet blast damage.

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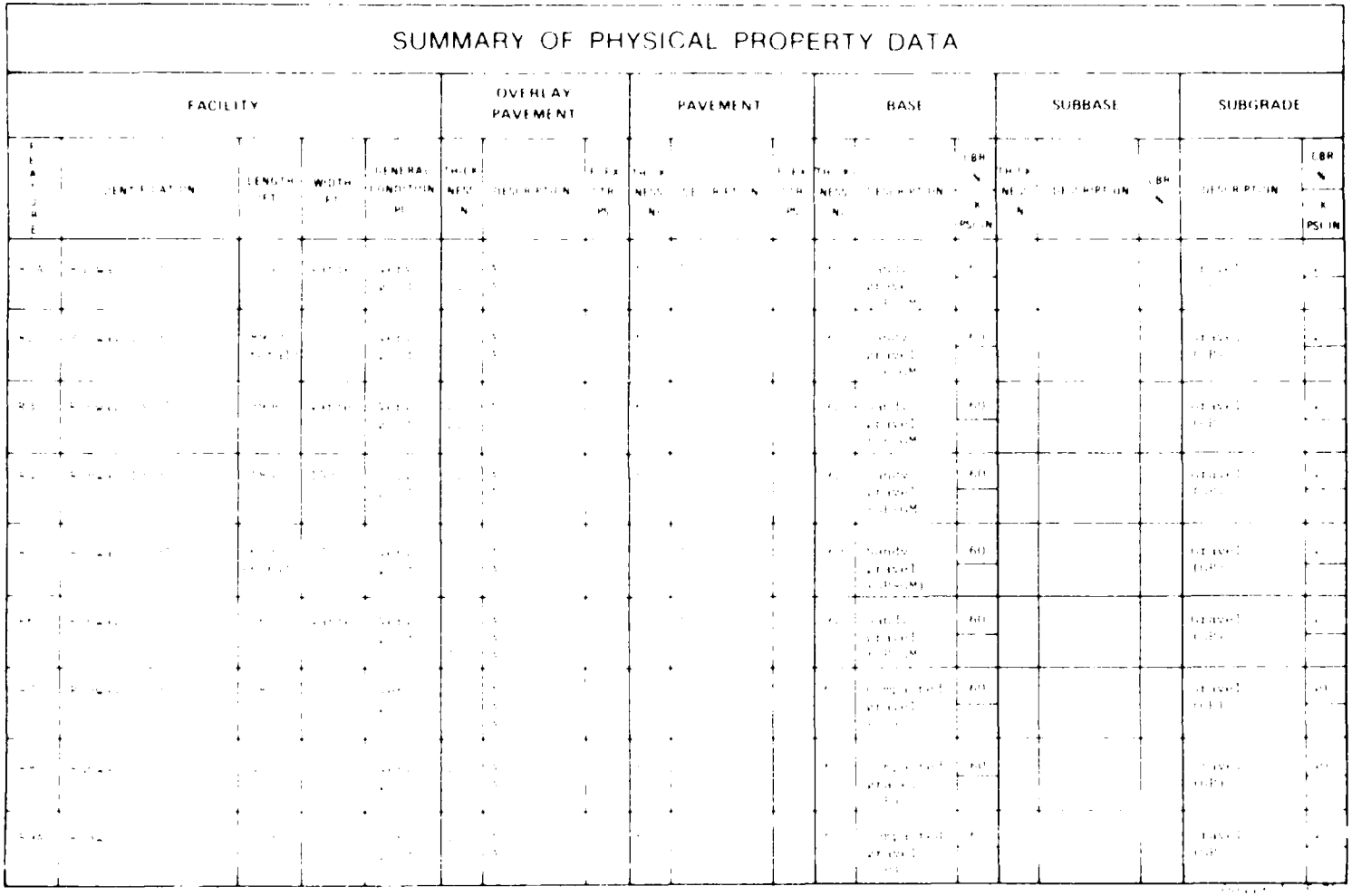

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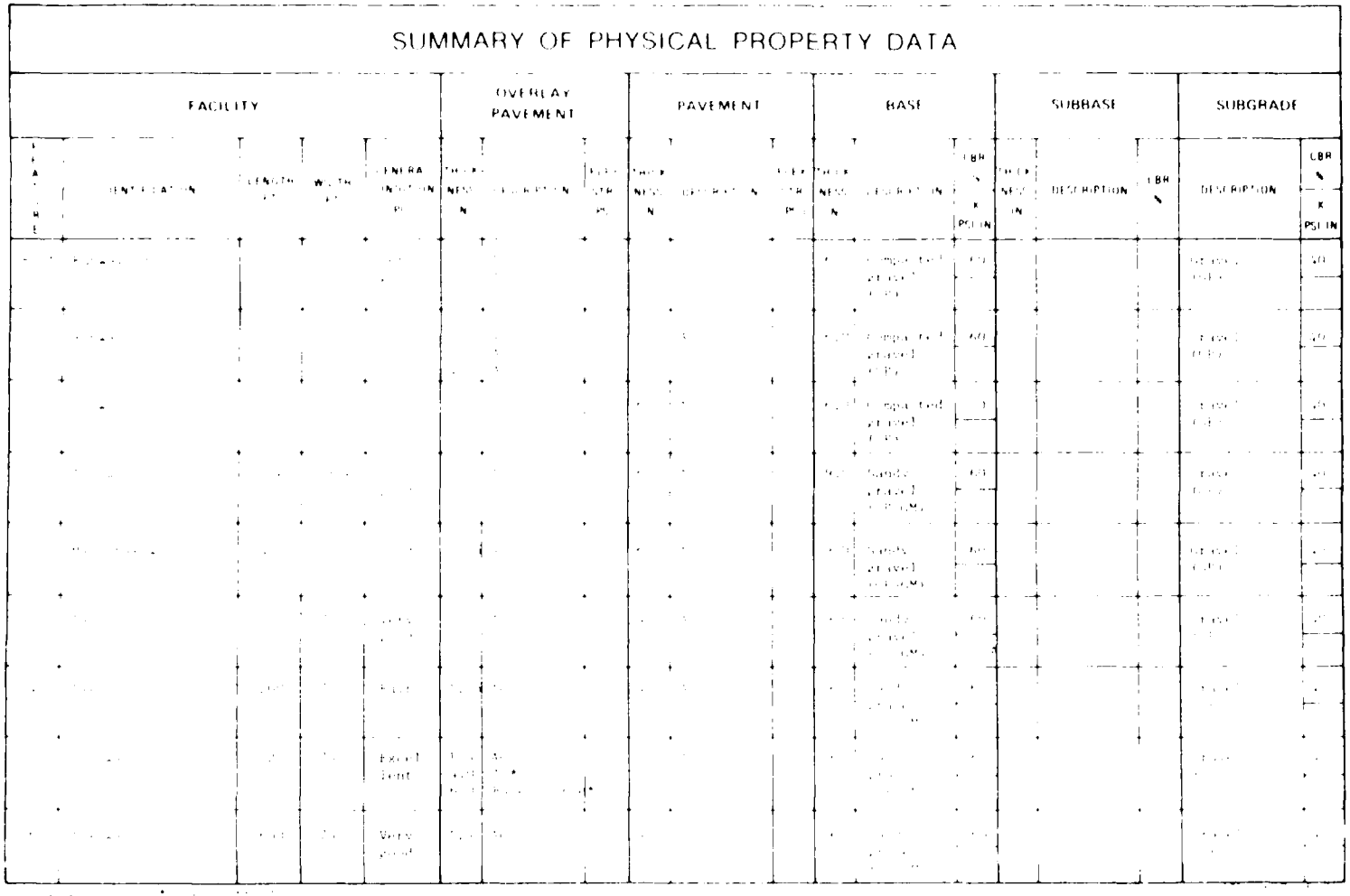

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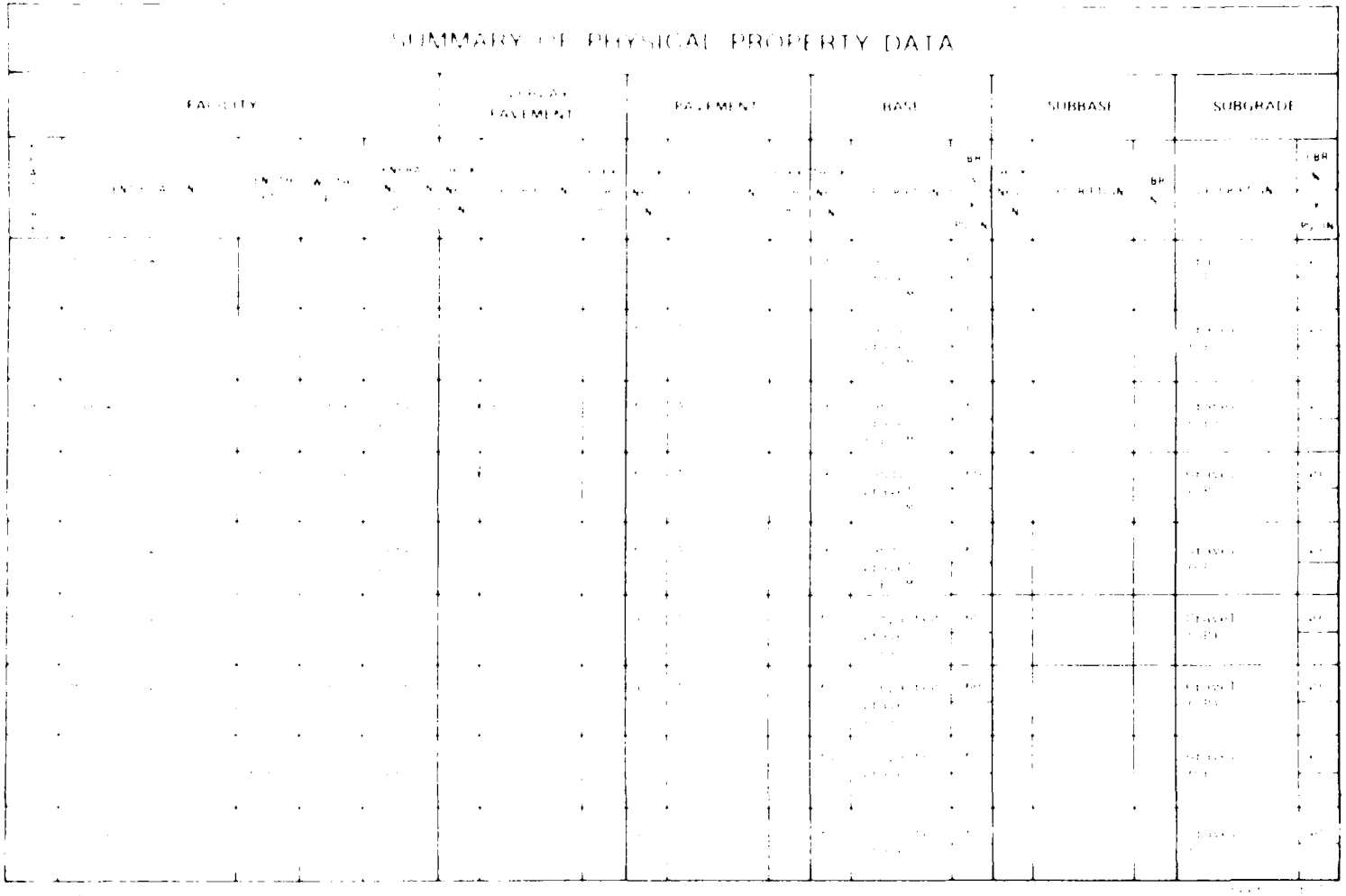
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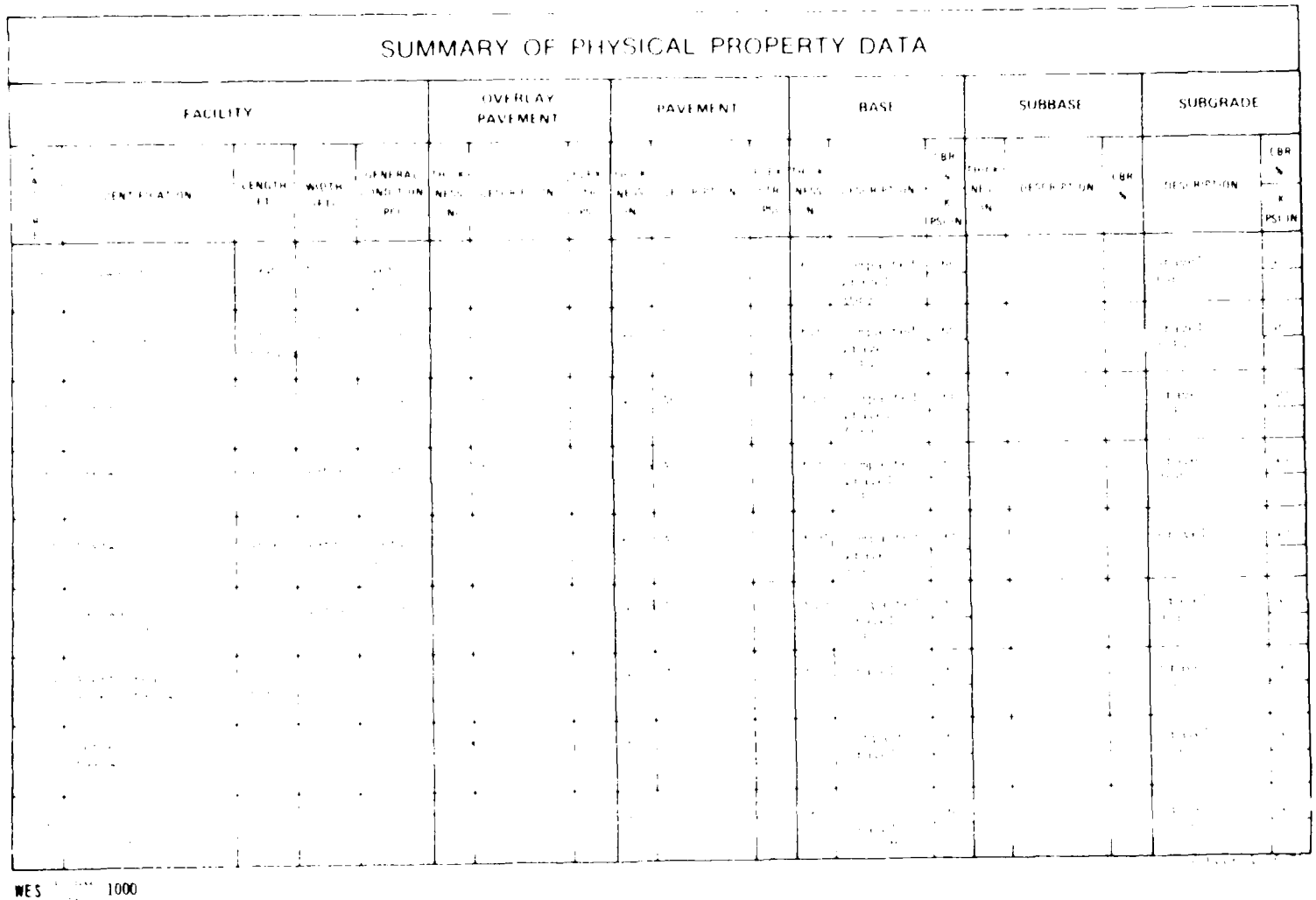
PAVEMENT
BASE
SUBBASE
SUBGRADE

WES 1000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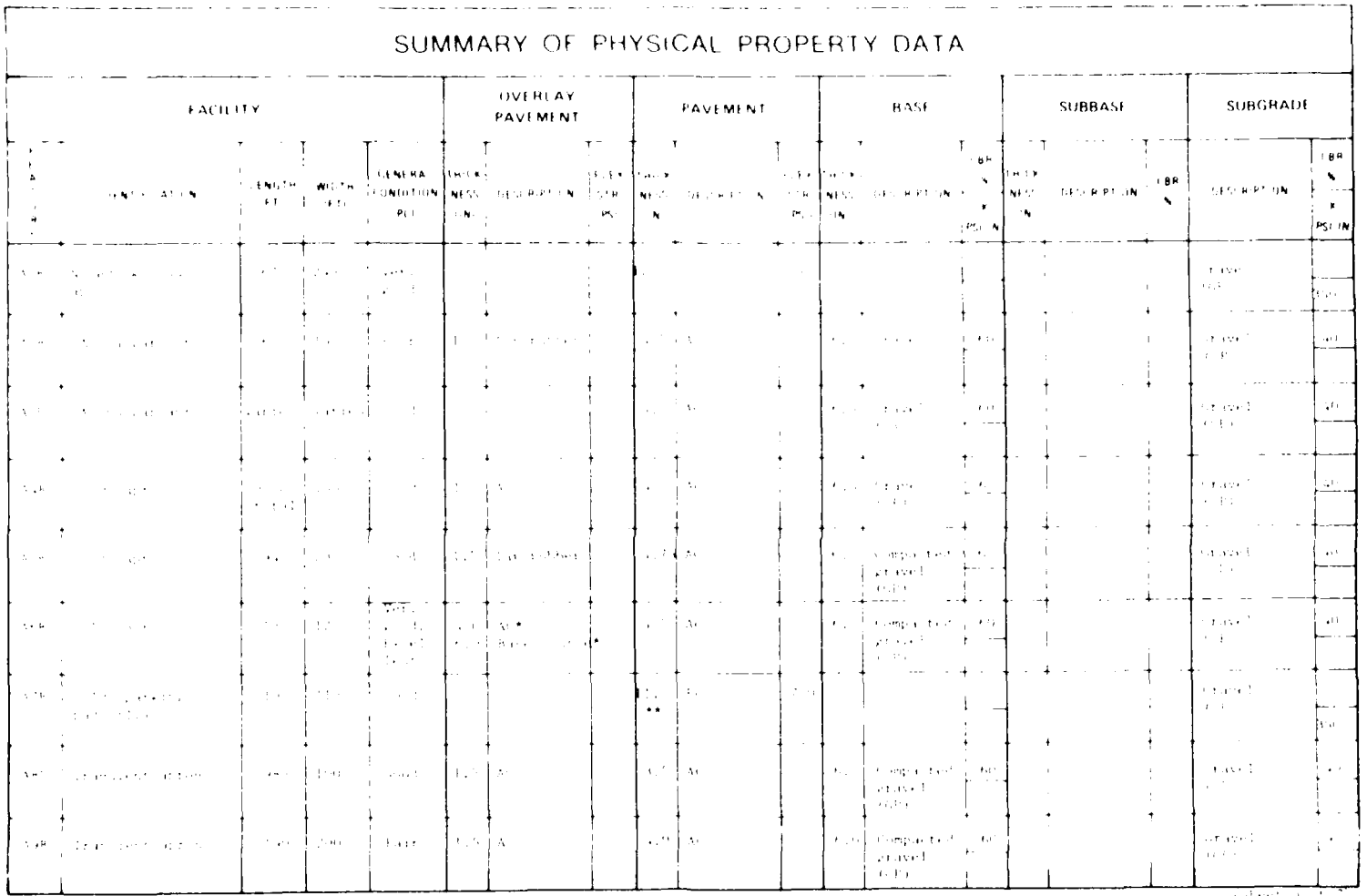
DESCRIPTION
CBR %
DESCRIPTION
CBR %
PSI

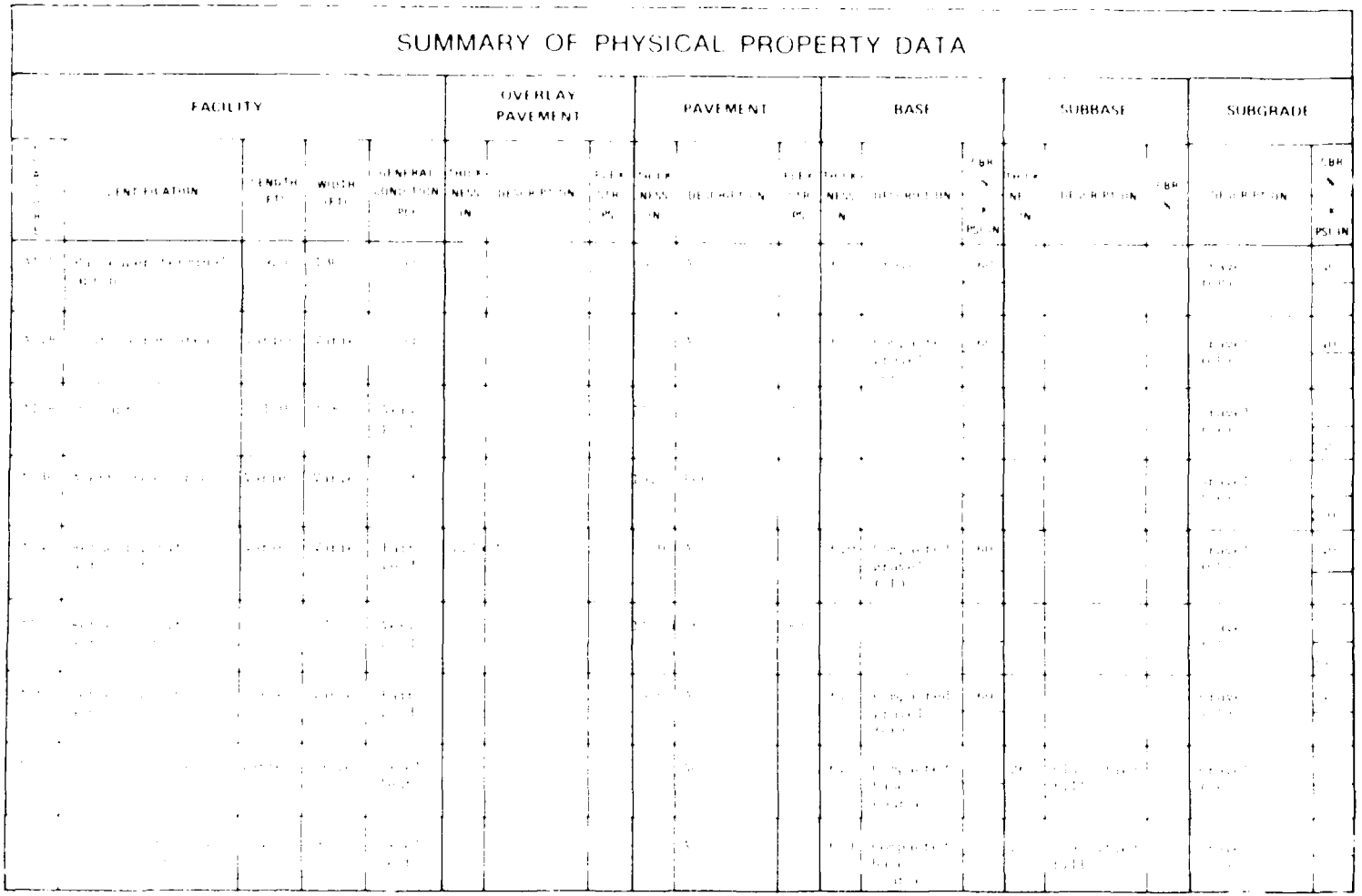
WES 1000

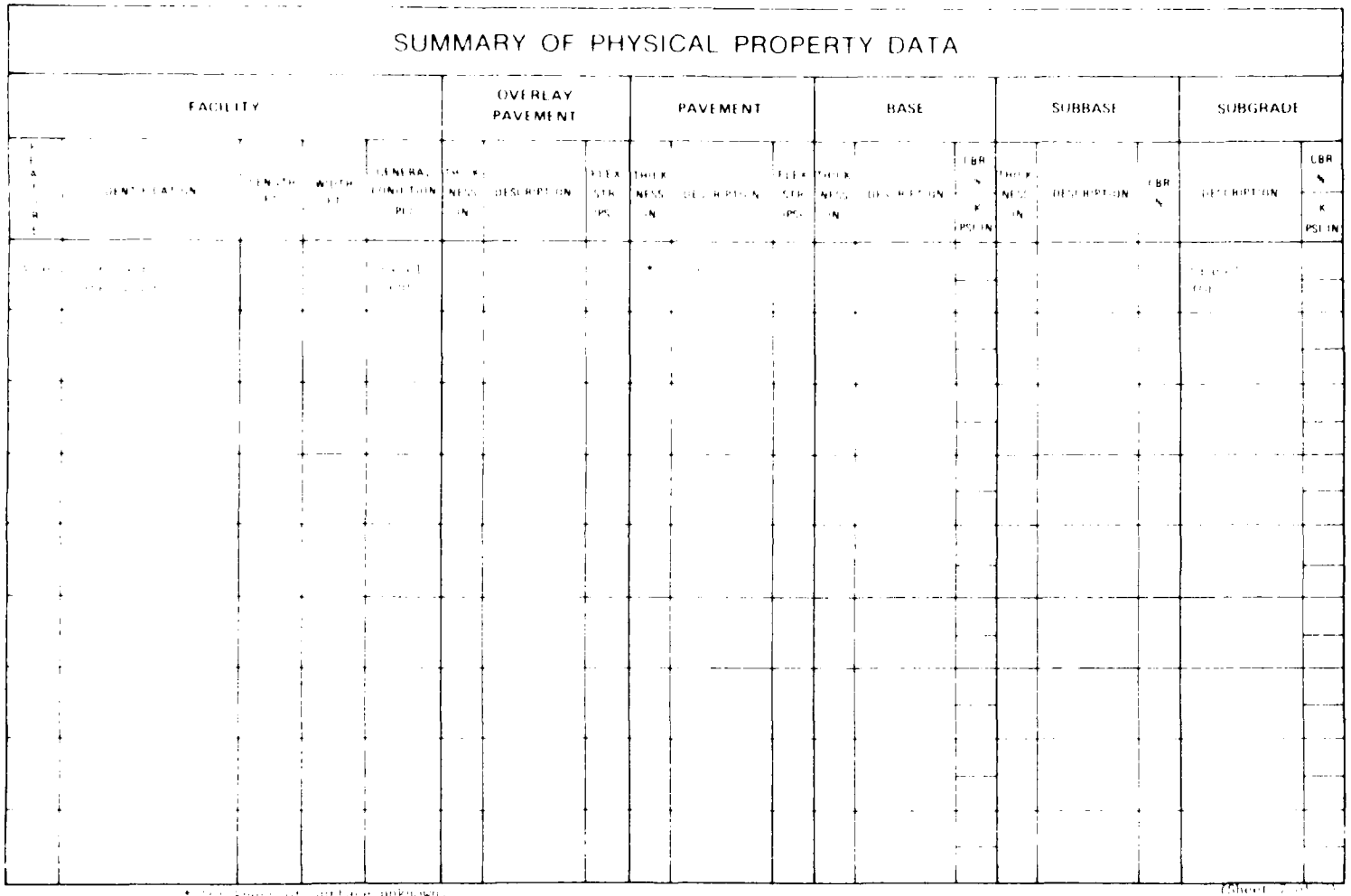
SUMMARY OF PHYSICAL PROPERTY DATA



WES FORM 1000 **

SUMMARY OF PHYSICAL PROPERTY DATA




SUMMARY OF PHYSICAL PROPERTY DATA
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OVERLAY PAVEMENT
PAVEMENT
BASE
SUBBASE
SUBGRADE
DESCRIPTION
DESCRIPTION
DESCRIPTION
DESCRIPTION
DESCRIPTION
CBR
K PSI/IN

WES [illegible] 1000

Table 4

PAVER Reports

Interactive or BATCH Reports	
LIST	Lists the branch number, branch name, and number of sections in each branch defined by the GENERATE command.
INV	Provides inventory information of pavement sections in the data base.
INSPECT	Provides a summary of all PCI and distress information on pavement sections in the data base.
INSPCUR	Provides a summary of the PCI and distress information on pavement sections in the data base for the most recent PCI survey for a given section.
SAMPLE	Lists both the summary and sample unit PCI and distress information on pavement sections in the data base.
SAMPCUR	Lists both the summary and sample unit PCI and distress information on pavement sections in the data base for the most recent PCI survey for a given section.
WORKREQ	Provides a list of user identified work requirements for pavement sections.
WORKHIS	Provides a list of user identified work requirements that have been performed on pavement sections.
RECORD	Provides detailed information on pavement sections in the data base.
POLICY	Prints the maintenance policy currently stored in the data base. The maintenance policy is used in reports MRG and ANALOC.
PCI	A list of section PCI's, ranked by PCI (low to high).
PCIA	A list of section PCI's in alphabetical order.
BATCH Processed Reports Only	
FREQ	PCI frequency diagram of the current year or any year in the future.
BUDPLAN	5-year projected budget level based on average cost of repair for each surface type.

(Continued)

Table 4 (Concluded)

BATCH Processed Reports Only (Continued)

[illegible]	-	[illegible] of sections to be inspected during a 5-year period.
[illegible]	-	PCI time curve for a specific section, including 5-year PCI projection.
[illegible]	-	Repair cost and, if desired, overlay cost based on user's maintenance and repair policy.
[illegible]	-	Personalized report based on user selected data elements and criteria.
[illegible]	-	Provides the user with three reports: (1) analysis of localized repair of a section, (2) PCI after repair of that section, and (3) MPI report for that section.

Table 5

PAVER Analysis Programs

Do Not Access the Data Base

ECON1	-	Economic analysis program that uses present worth analysis and equivalent annual uniform cost.
VOL7	-	PCI prediction models for airfield AC or PCC pavements.
PREDICT	-	Statistical analysis routine to predict the quantity and severity of a given distress type over a future period.
EVAL	-	Provides recommended feasible maintenance and rehabilitation alternatives based on user response to an evaluation summary.
CONLOC	-	PCI prediction of a pavement section after localized repair is performed.
BENEFIT	-	Computes a benefit value based on the area under the PCI time curve weighted by utility (PCI preference rating and relative weight values (relative pavement performance).
BUDOPT	-	Optimizes a fixed budget for a set of projects using equivalent uniform annual costs and benefits.
PCICALC	-	This allows users to calculate the PCI without entering data into the data base.
PCICHEC	-	Checks the data that goes into PCICALC.
PCIRES	-	Gives the results from the calculated PCI for later printing.

Does Access the Data Base

ANALOC	-	Analysis of localized repair with PCI after repair report and MRG after repair report.

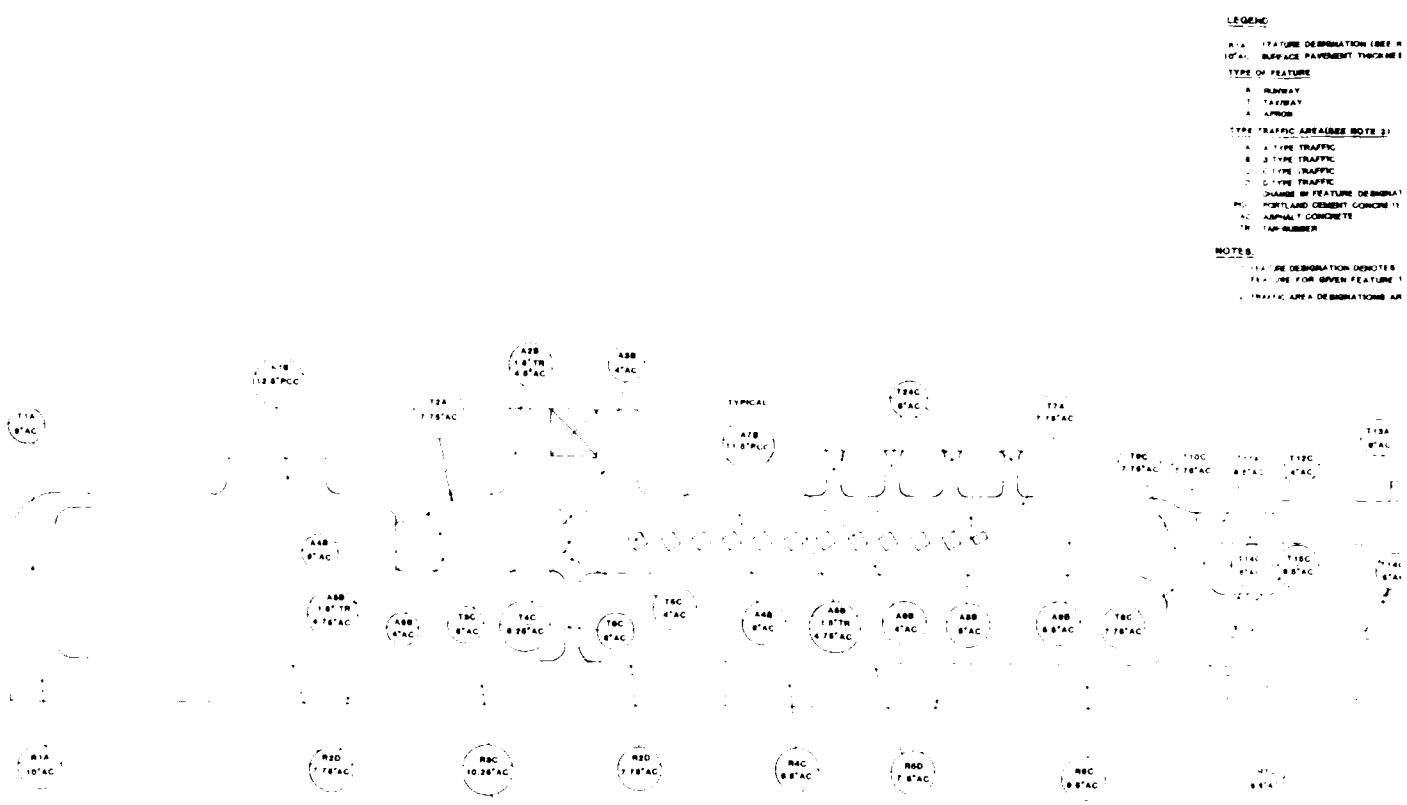
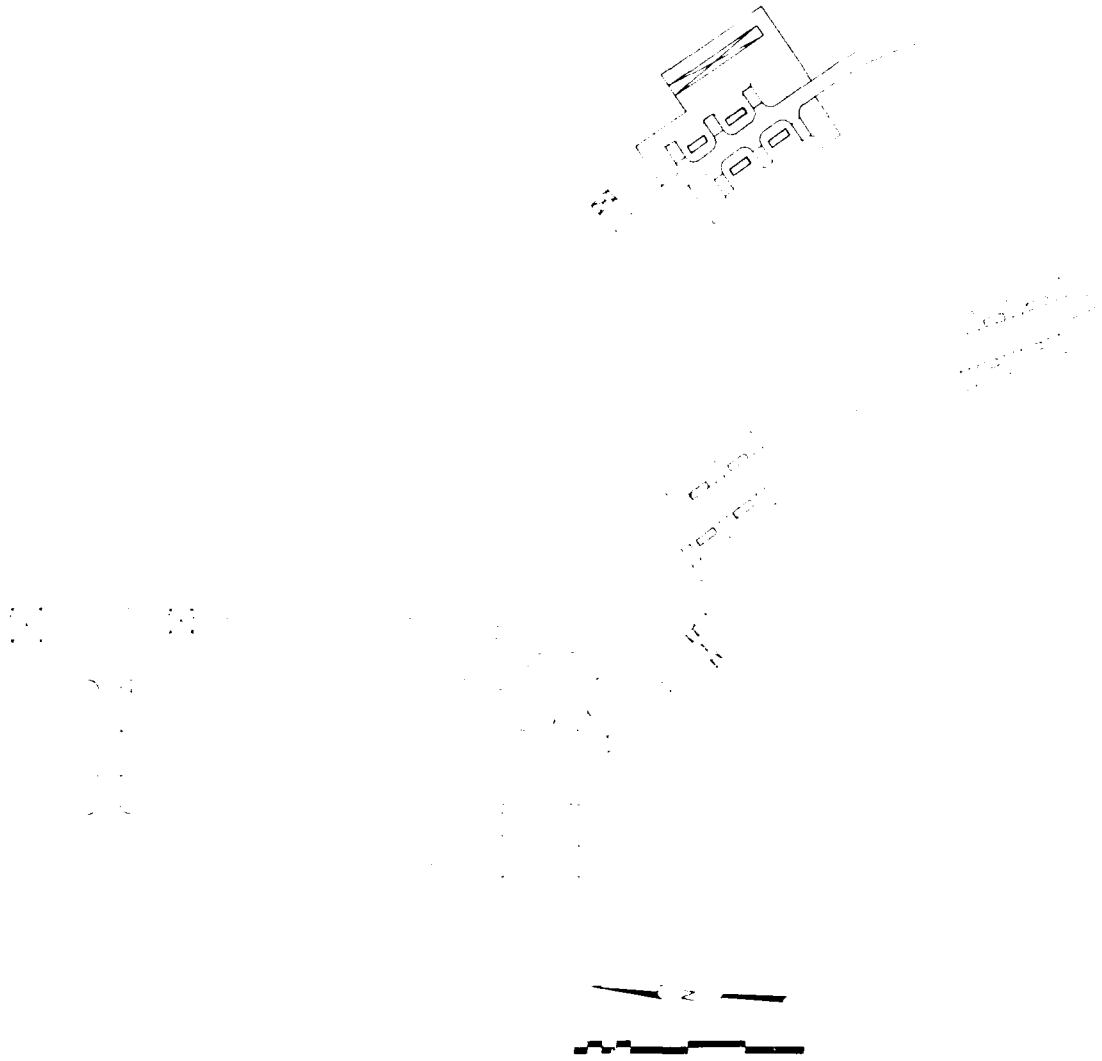


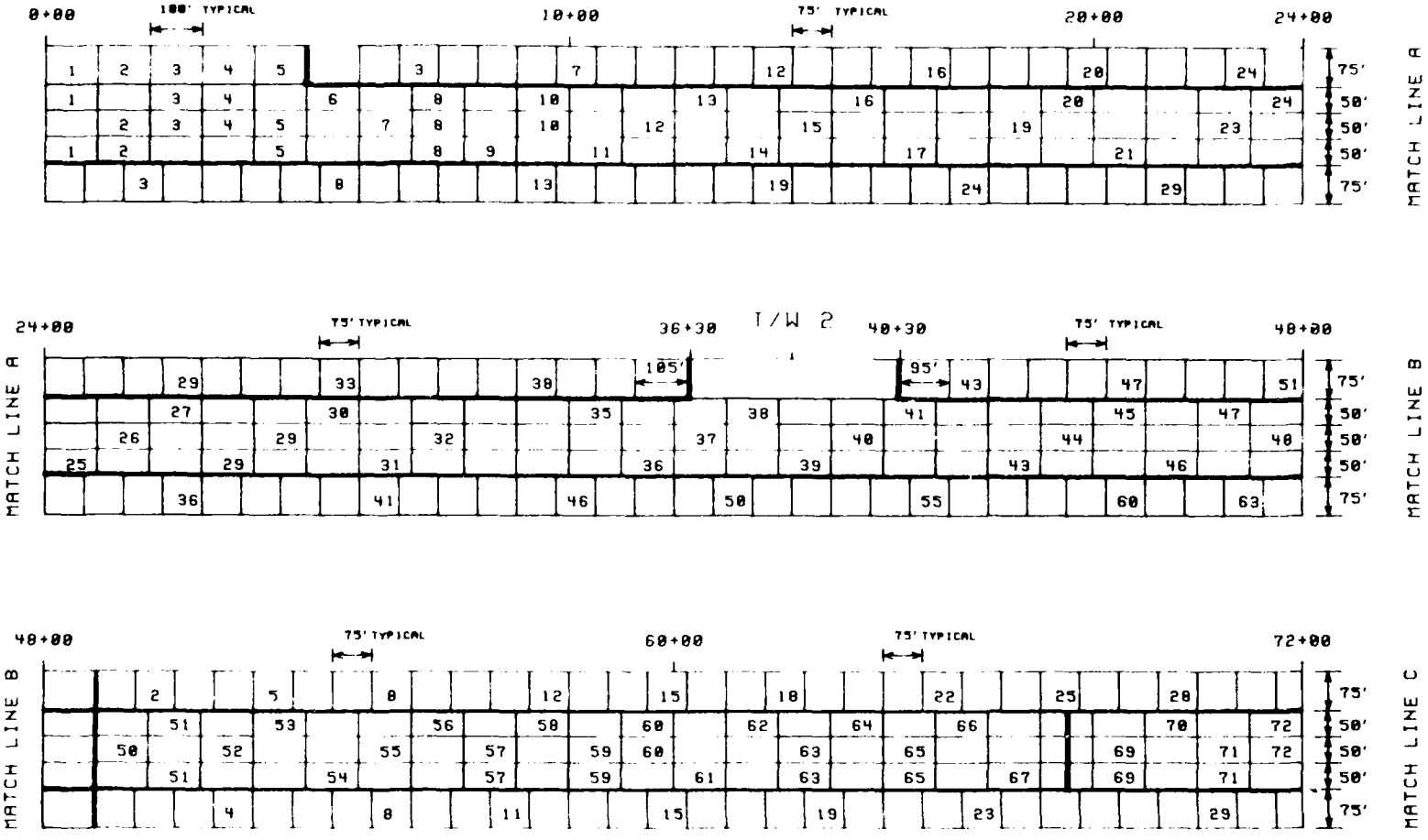
Figure 1. Pavement layout and feature i

and feature identification at Eielson AFB

Figure 2. Stationing for Runway 4-22 ar



...y 4-22 and certain taxiway features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100' TYPICAL
10+00
75' TYPICAL
20+00
24+00
MATCH LINE A
24+00
75' TYPICAL
36+30
T/W 2
40+30
75' TYPICAL
48+00
MATCH LINE A
MATCH LINE B
48+00
75' TYPICAL
60+00
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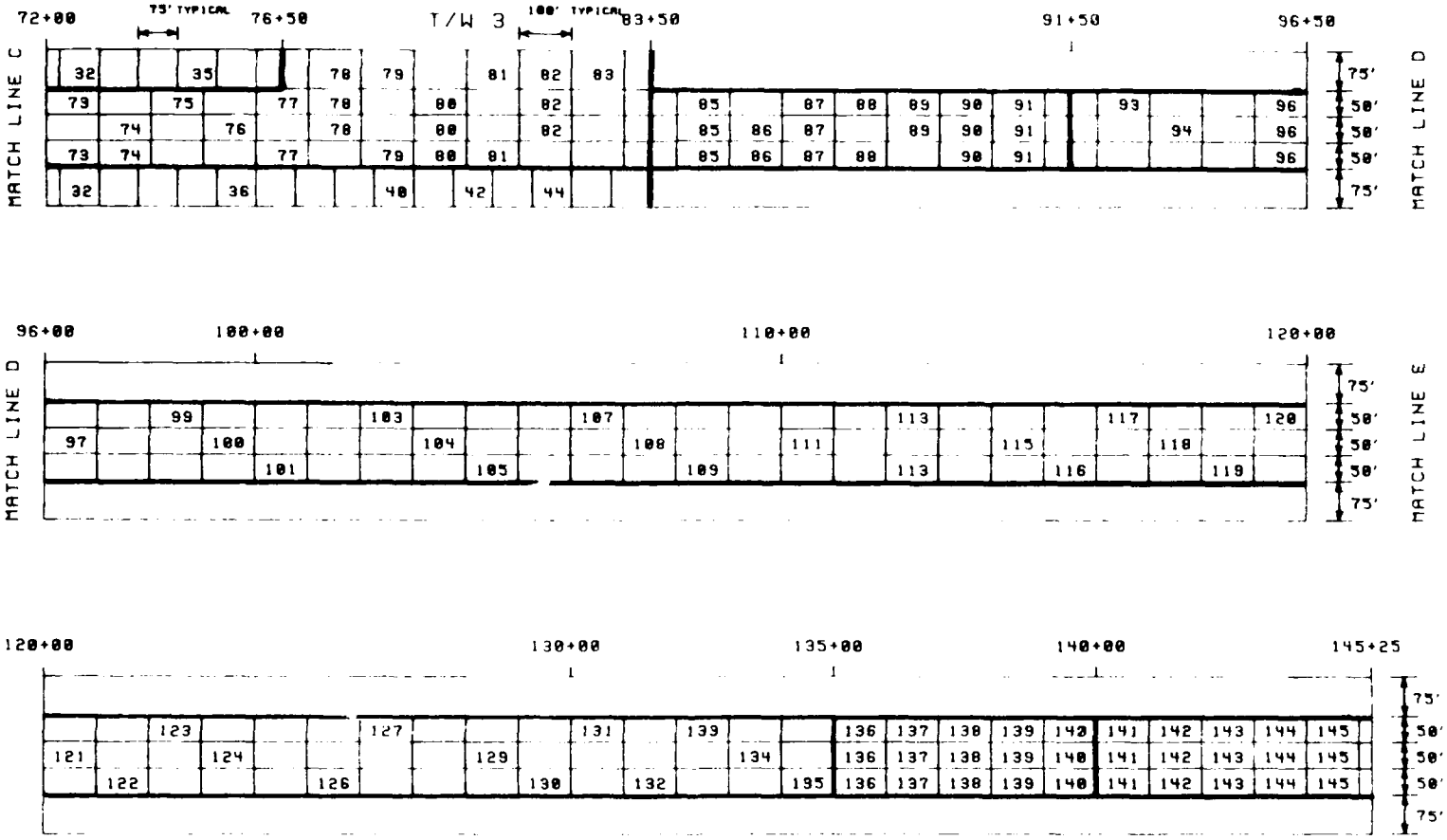
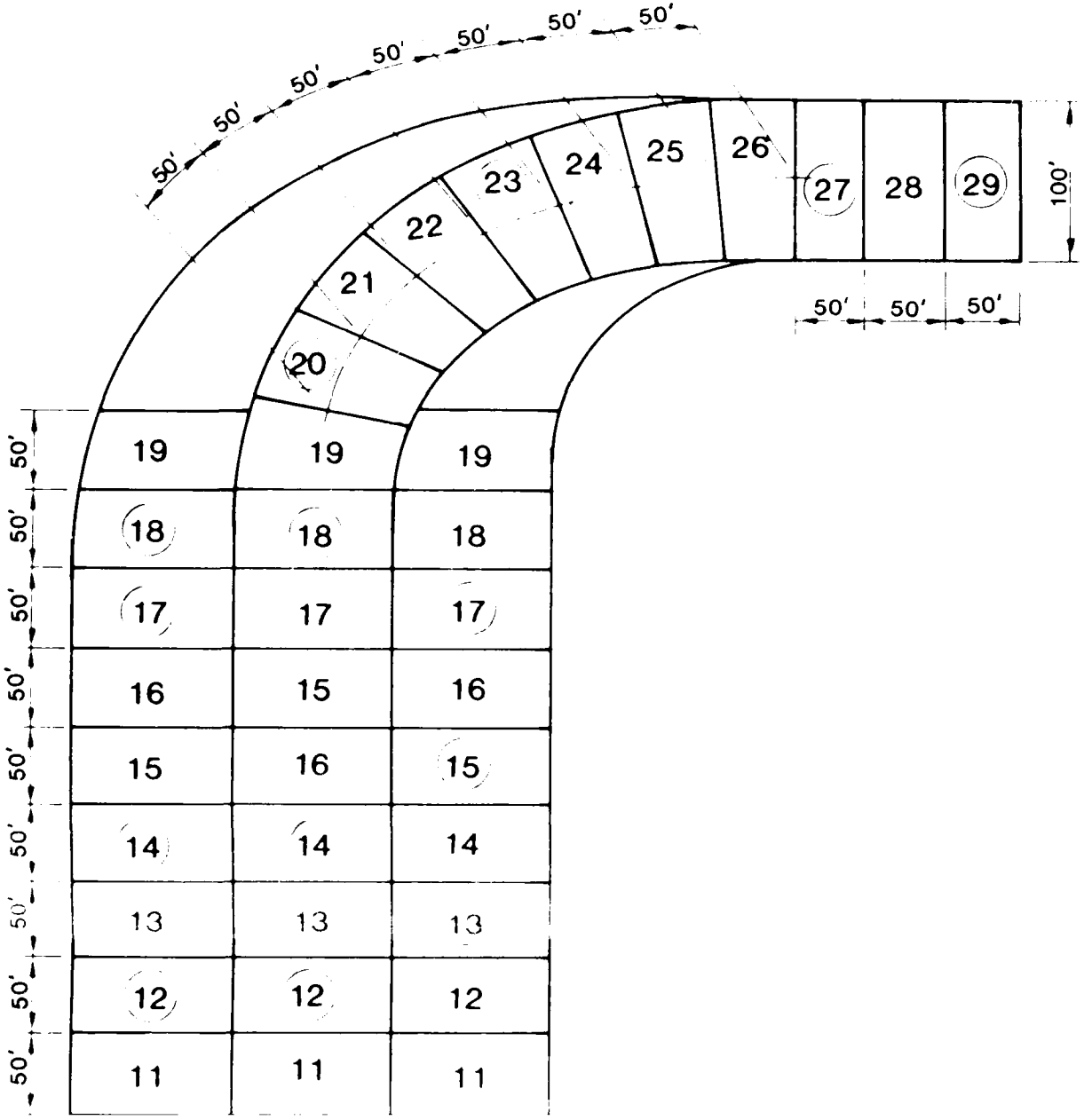
72+00
MATCH LINE B
MATCH LINE C
105'
95'
75'
50'


72+00
75' TYPICAL
76+50
T/W 3
100' TYPICAL
83+50
91+50
96+50
MATCH LINE C
MATCH LINE D
75'
50'
50'
50'
75'
96+00
100+00
110+00
120+00
MATCH LINE D
MATCH LINE E
120+00
130+00
135+00
140+00
145+25


50'
50'
50'
50'
50'
50'
50'
50'
50'
50'
50'
50'
50'
50'
50'
50'
50'
100'
19
18
17
16
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14
13
12
11
20
21
22
23
24
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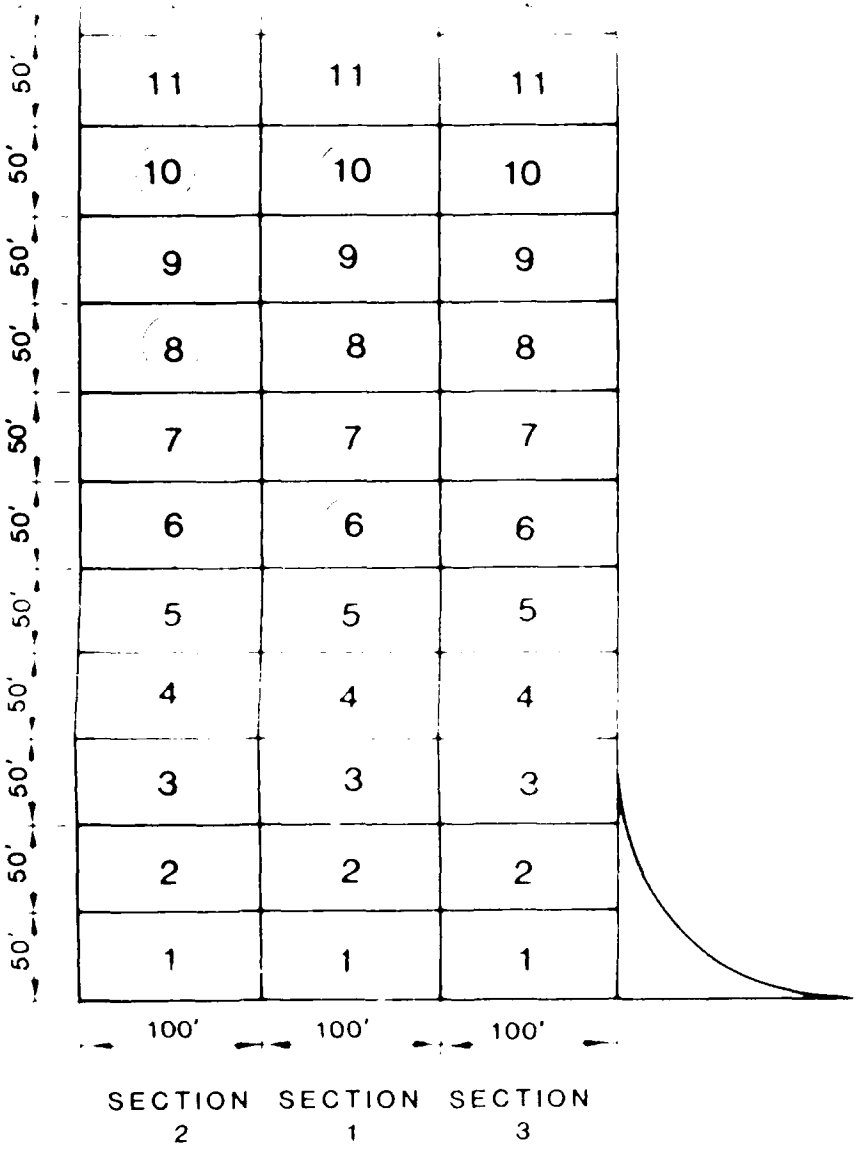
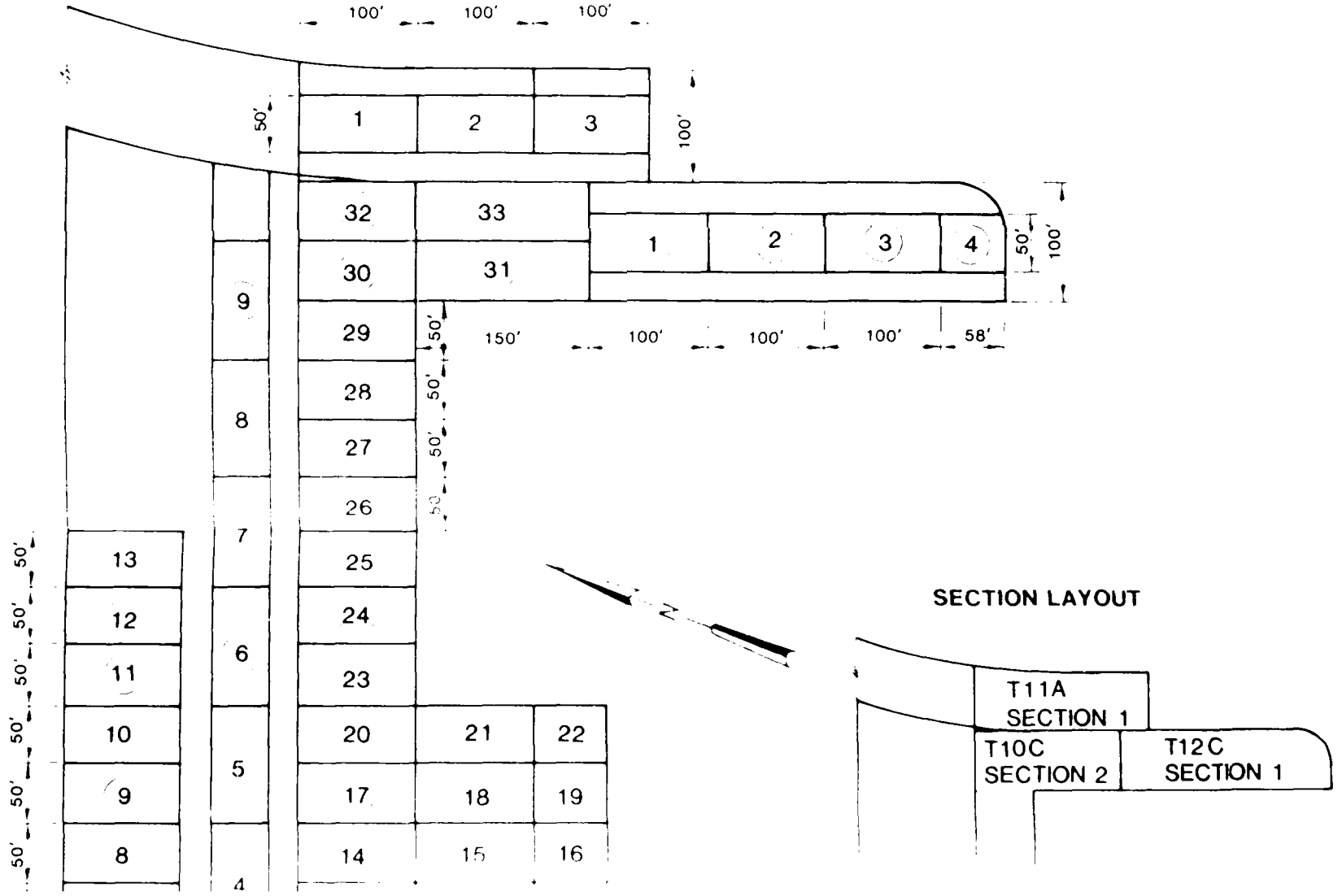
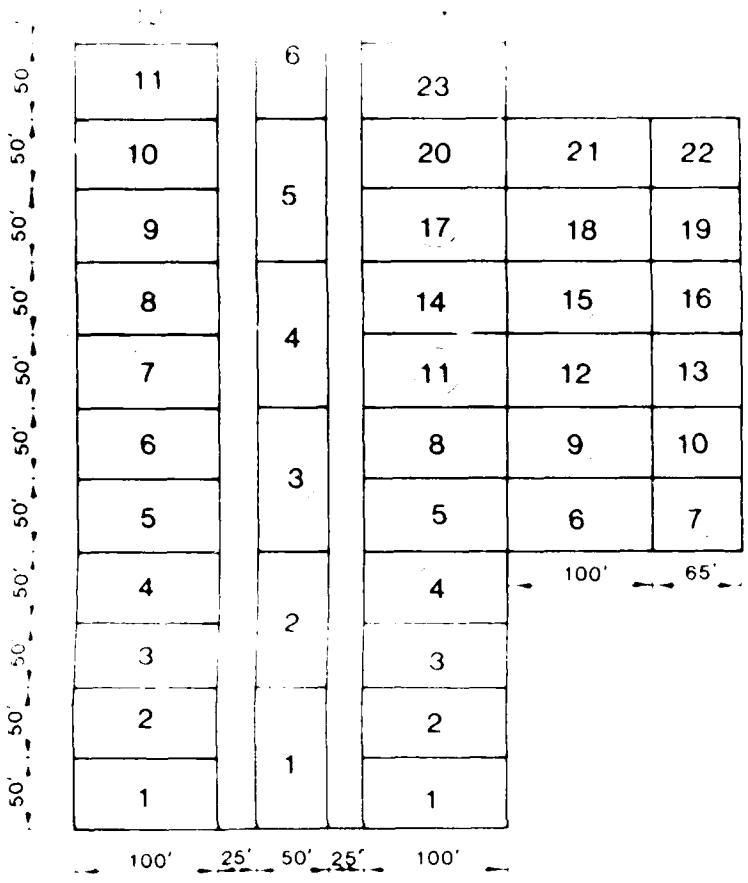
26
27
28
29

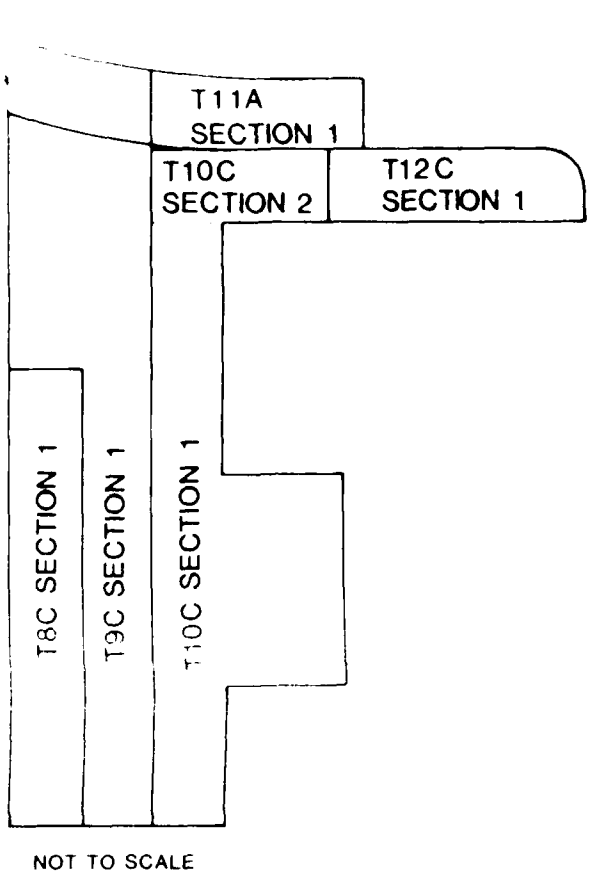


FEATURE: T 1 A

Figure 9. Surveyed sample units, Feature T1A

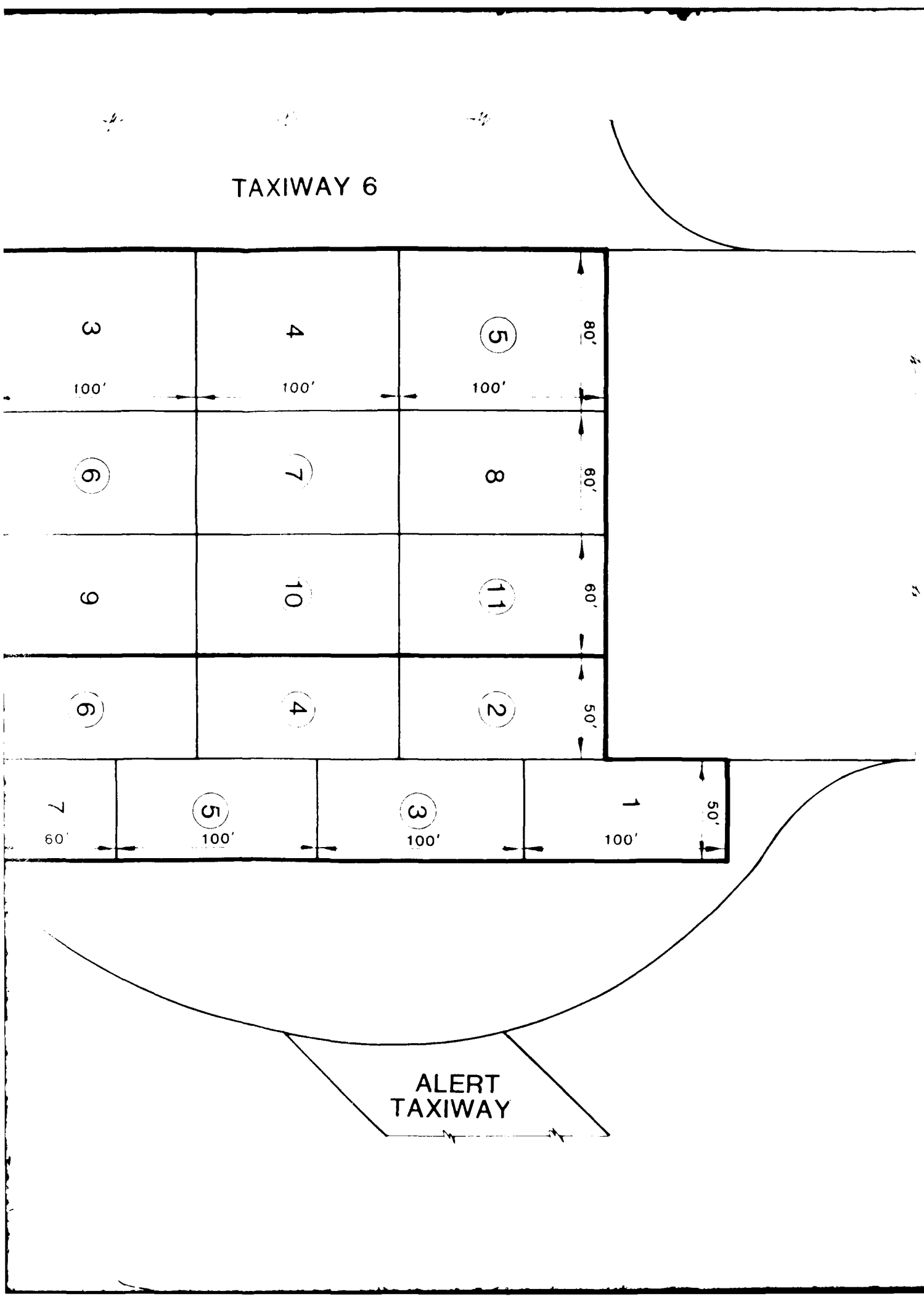

100'
100'
100'
50'
100'
1
2
3
32
33
30
31
1
2
3
4
50'
100'
9
29
150'
100'
100'
100'
58'
50'
8
28
50'
27
50'
26
50'
7
13
25
50'
12
24
50'
6
11
23
50'
10
20
21
22
50'
5
9
17
18
19
50'
8
14
15
16
4
SECTION LAYOUT
T11A
SECTION 1
T10C
SECTION 2
T12C
SECTION 1





FEATURES: T8C, T9C, T10C, T11A & T12C

Figure 6. Section layout and surveyed sample units, Features T8C, T9C, T10C, T11A, and T12C


TAXIWAY 6
3
4
5
80'
100'
100'
100'
6
7
8
80'
9
10
11
80'
6
4
2
50'
7
60'
5
100'
3
100'
1
100'
50'
ALERT
TAXIWAY

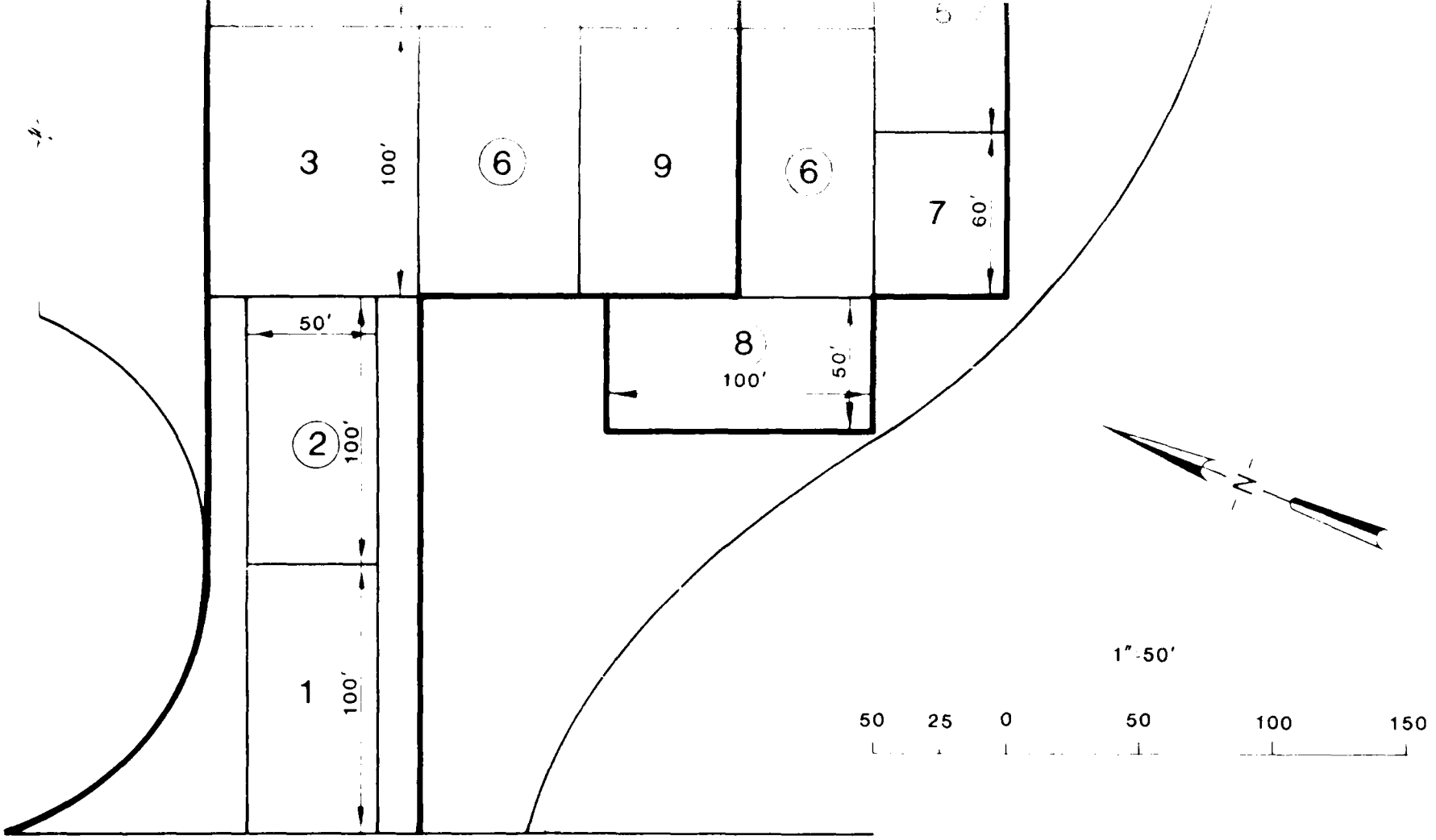


Figure 7. Surveyed sample units, Features T20A and T21A

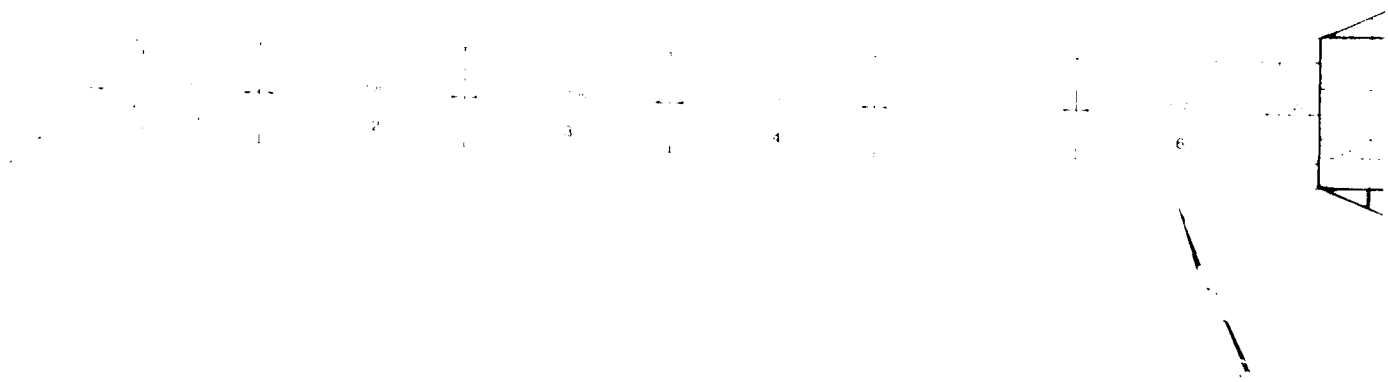
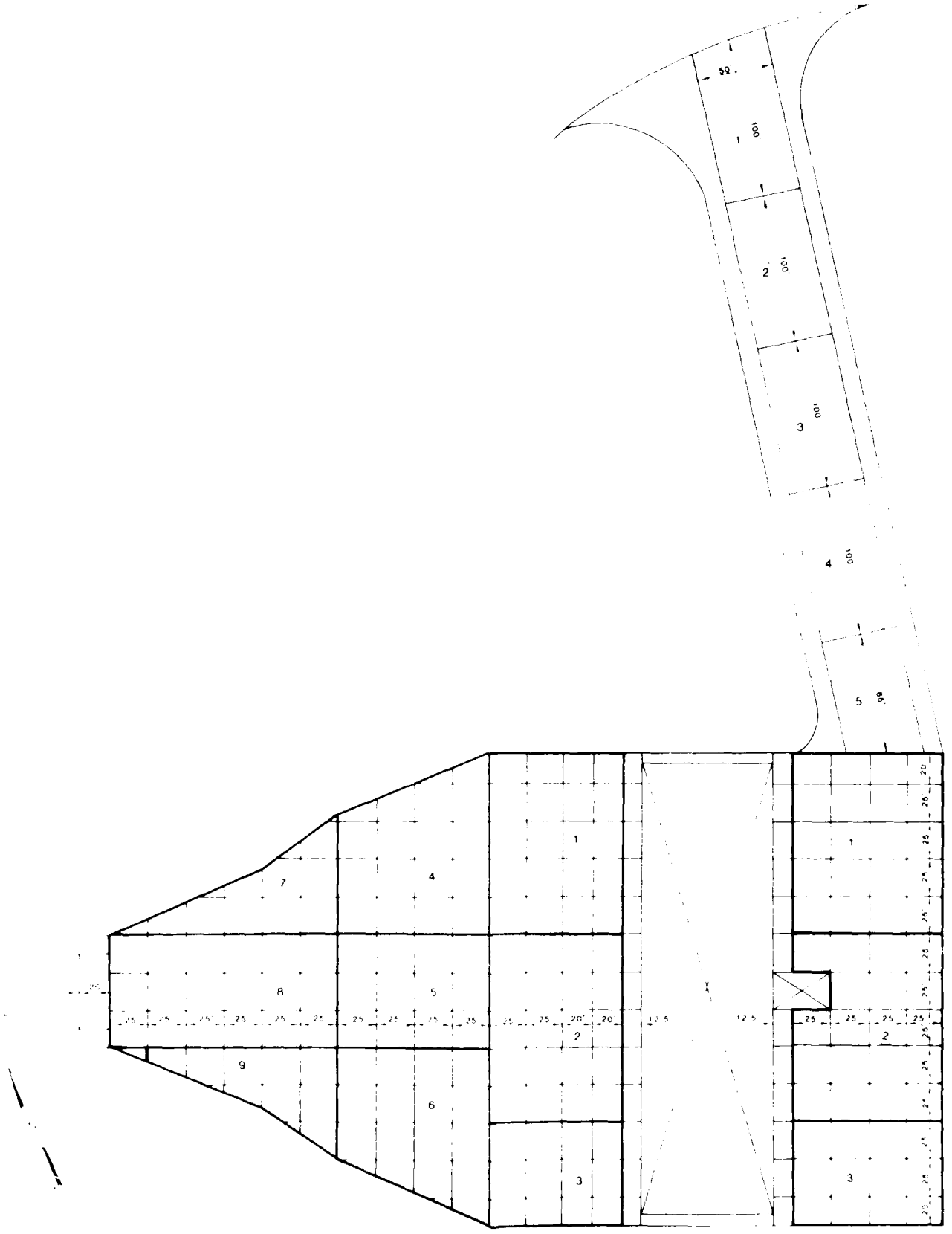


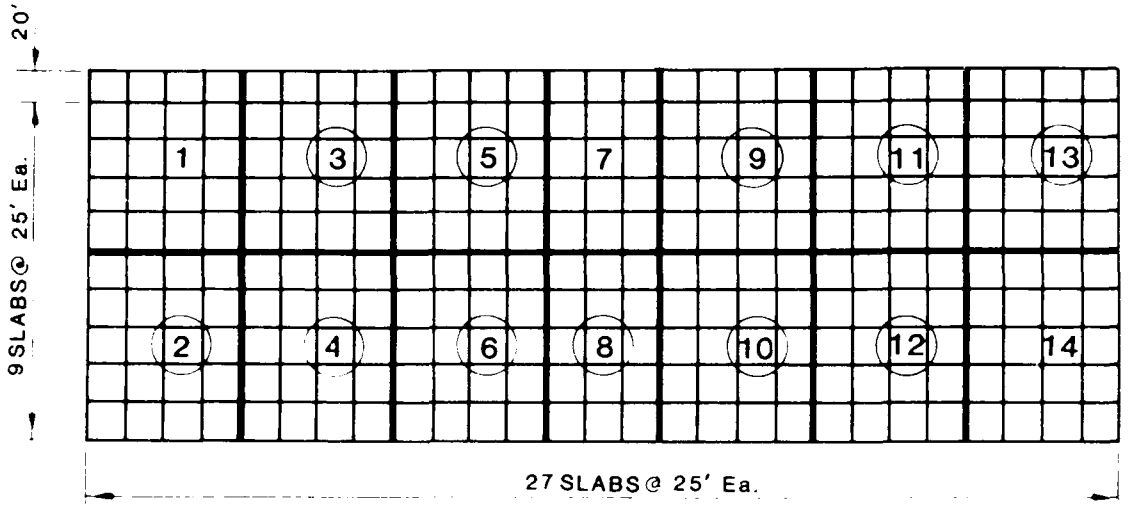
Figure 8. Surveyed sample units, Features [illegible] and A13B



FEATURES T22A and A13B

SCALE 1" = 40'

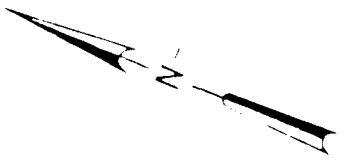
40 20 0 40 80



NOSEDOCKS 1 & 2 - FEATURES: A1B

SCALE : 1"=100'

100 50 0 100 200



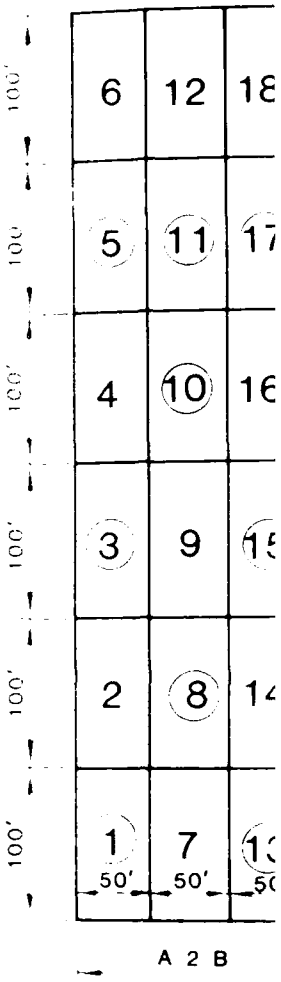
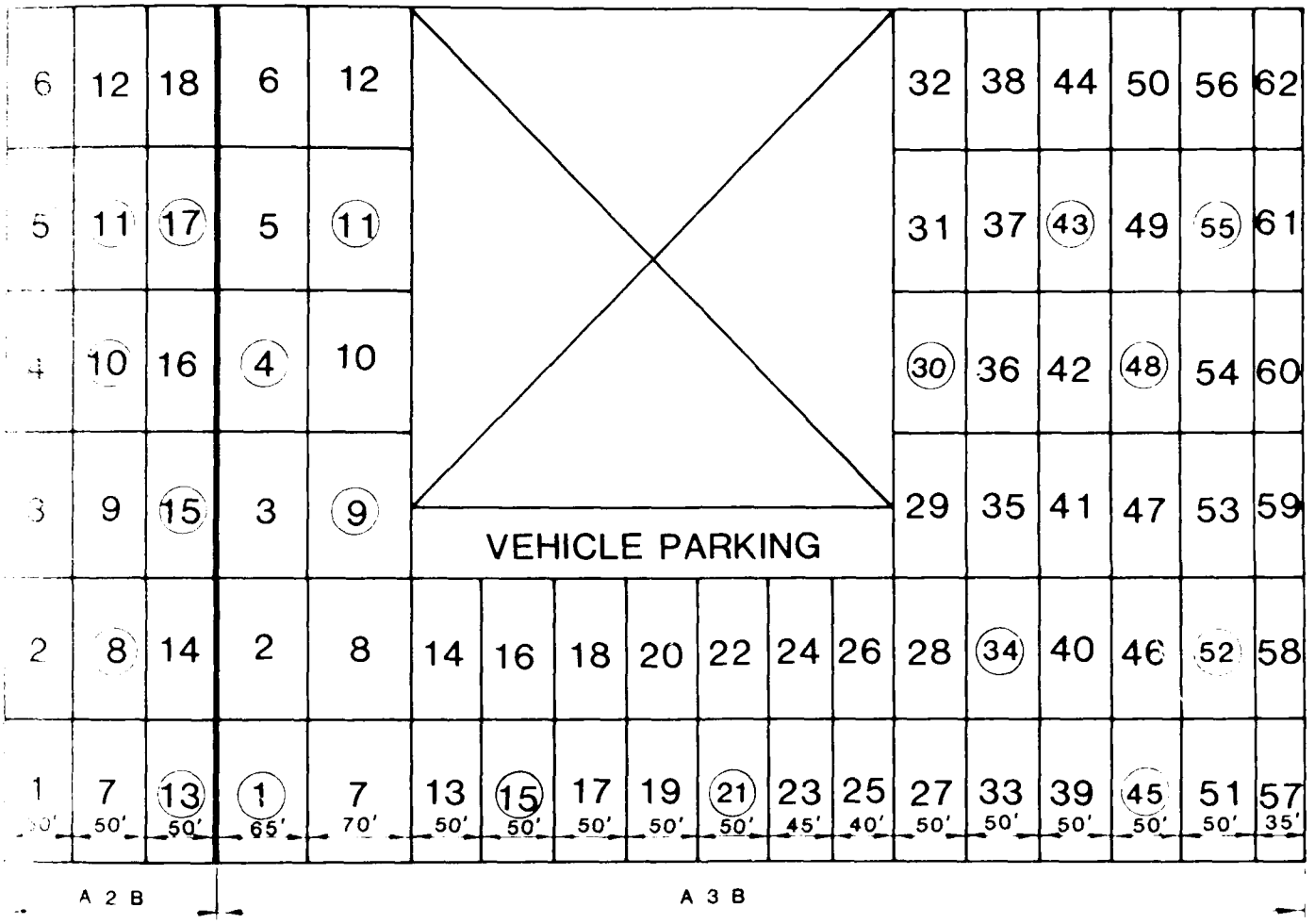


Figure 9. Surveyed sample units, Feature



SAC HANGAR APRON - FEATURES: A2B & A3B

SCALE : 1"=100'

100 50 0 100 200

...ts, features A1B, A2B, and A3B

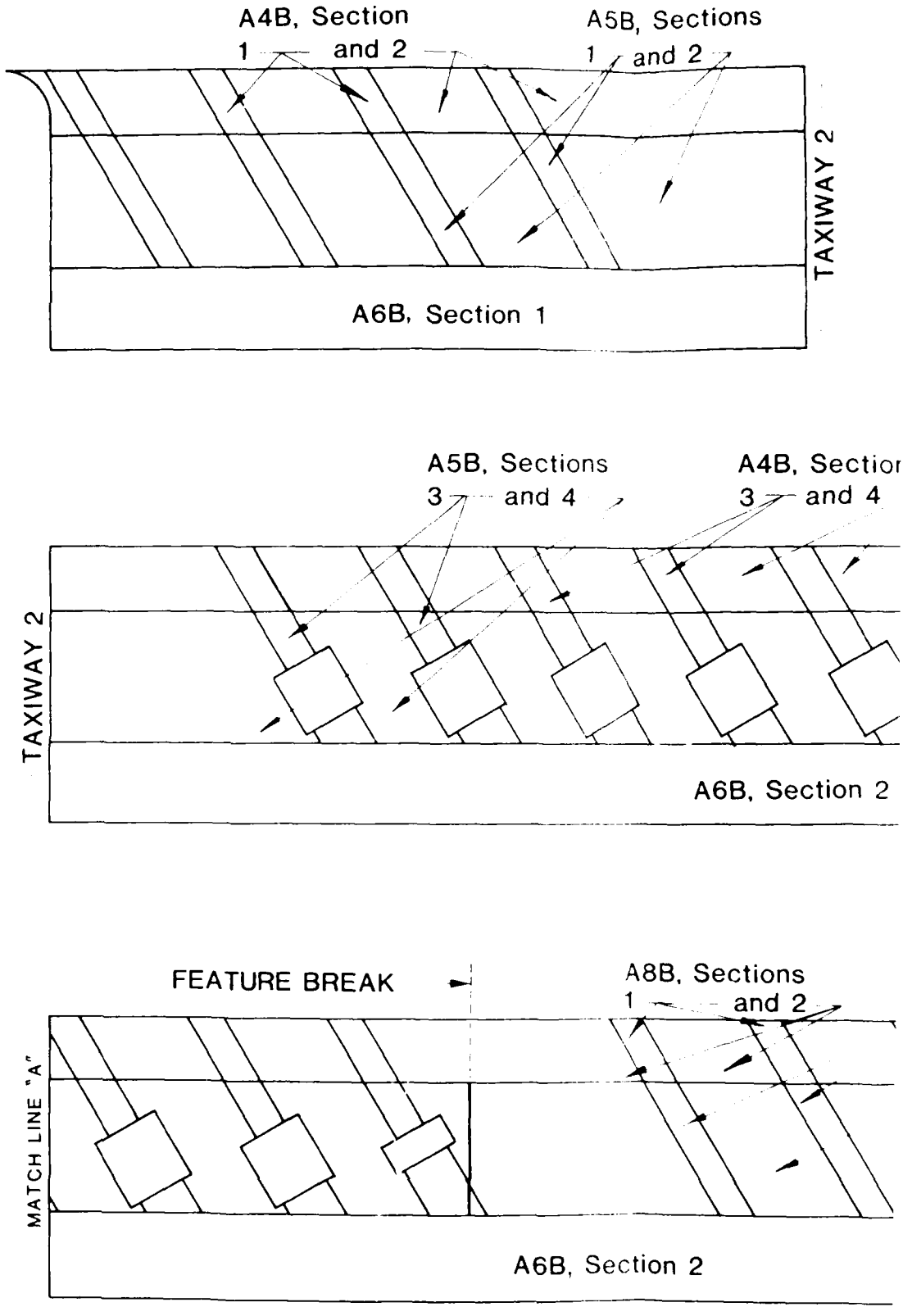


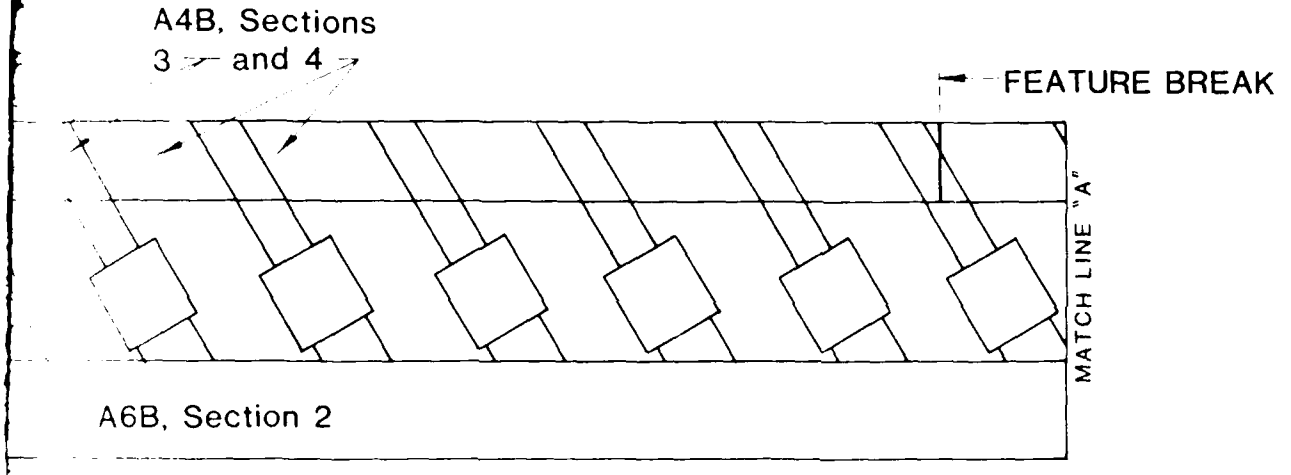
Figure 10. [illegible]ection layout, Feature

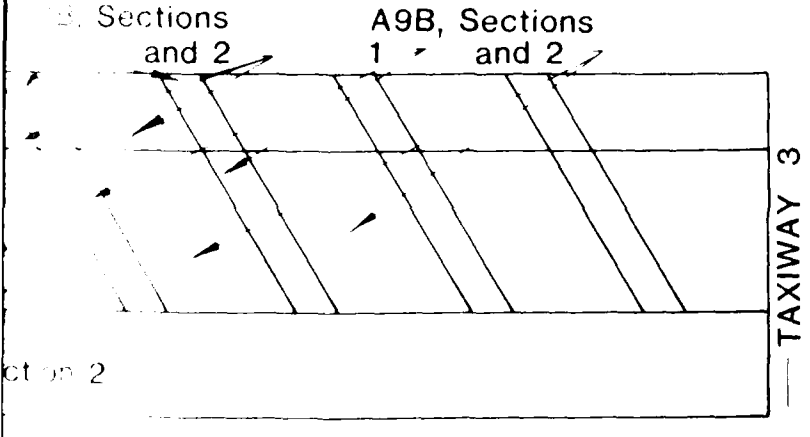
B, Sections
and 2

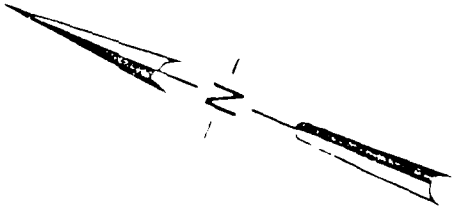
TAXIWAY 2

SECTION LAYOUT - KC-135 APRON FEATURES

TAXILANES	NON-TAXILANES
A4B, Sections 1&3	A4B - Sections 2&4
A5B, Sections 1&3	A5B - Sections 2&4
A6B, Sections 1&2	A8B - Section 2
A8B, Section 1	A9B - Section 2
A9B, Section 1	







NOT TO SCALE

...yout, Features A4B, A5B, A6B, A8B, and A9B

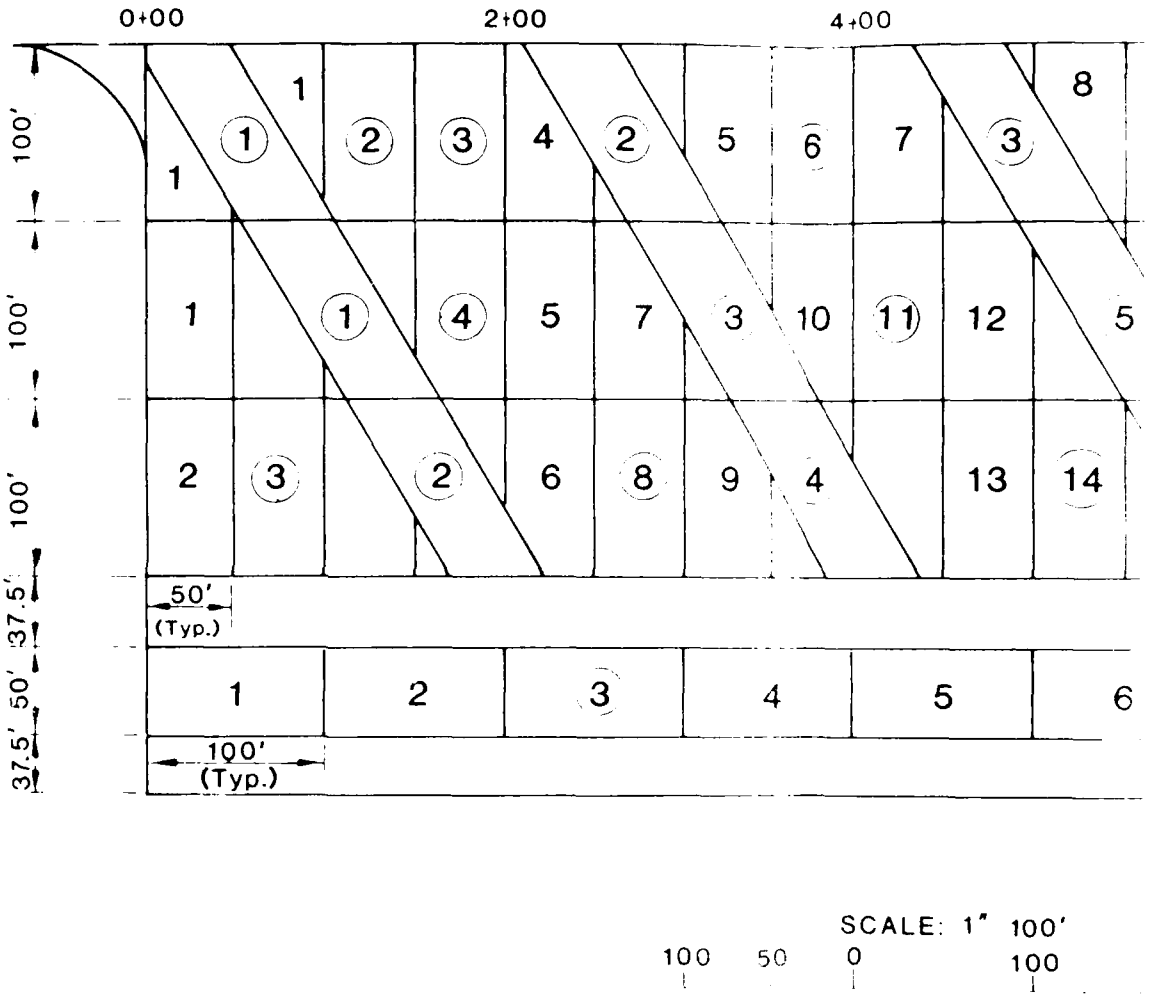
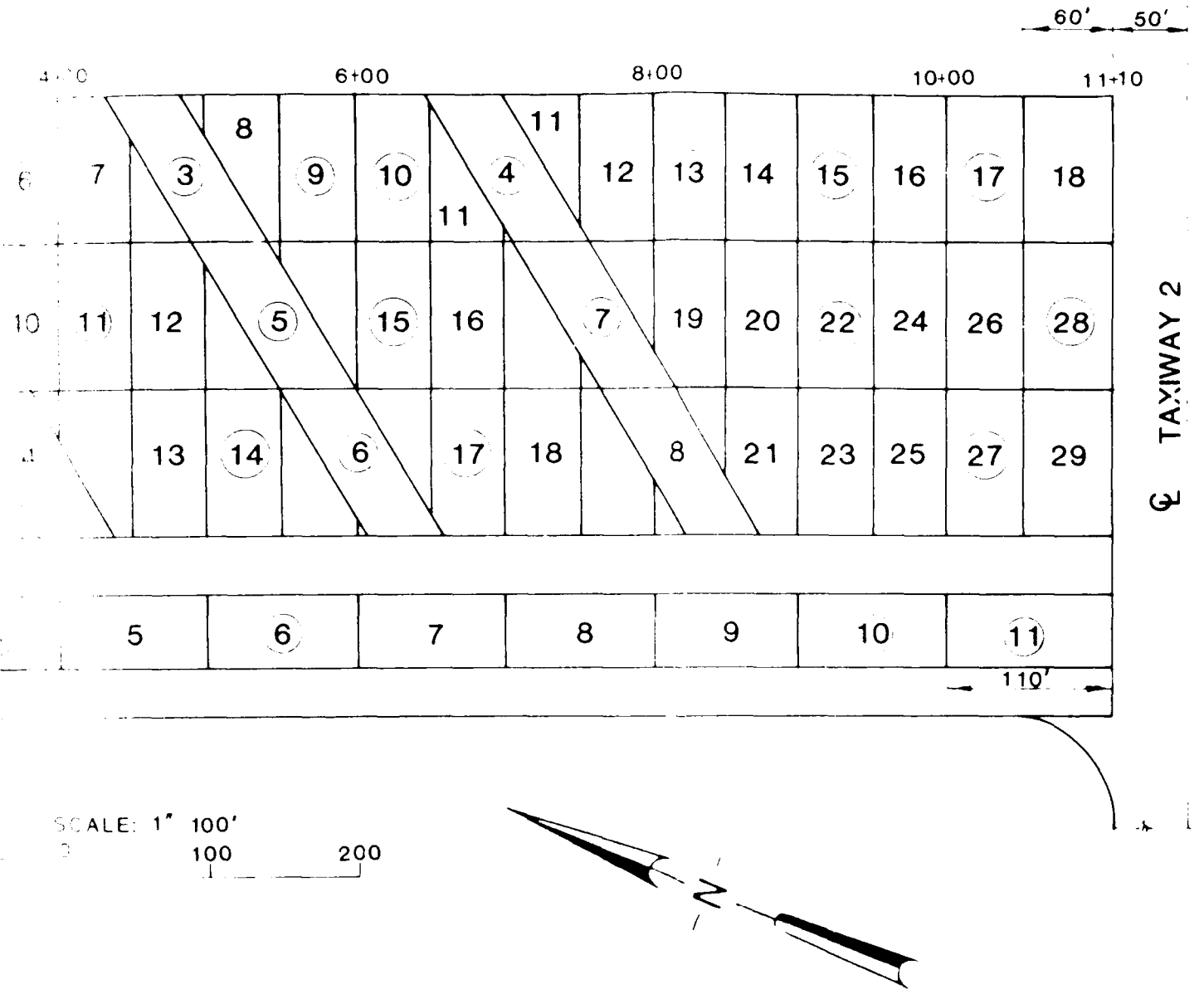


Figure 11. Surveyed sample units, Sections 1 and 2 of Fe



SCALE: 1" 100'

100 200

N

and 2 of Features A4B and A5B and Section 1 of Feature A6B

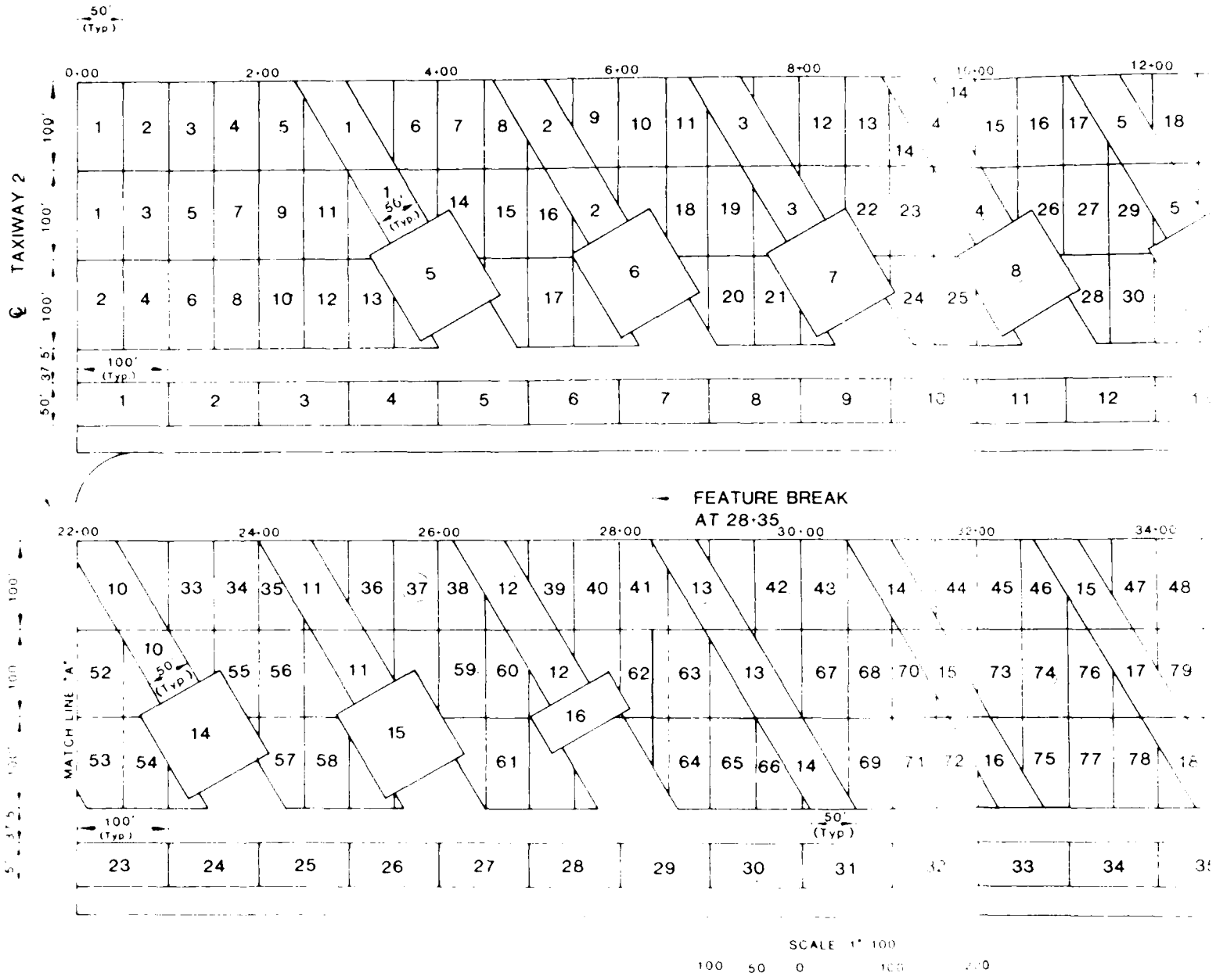
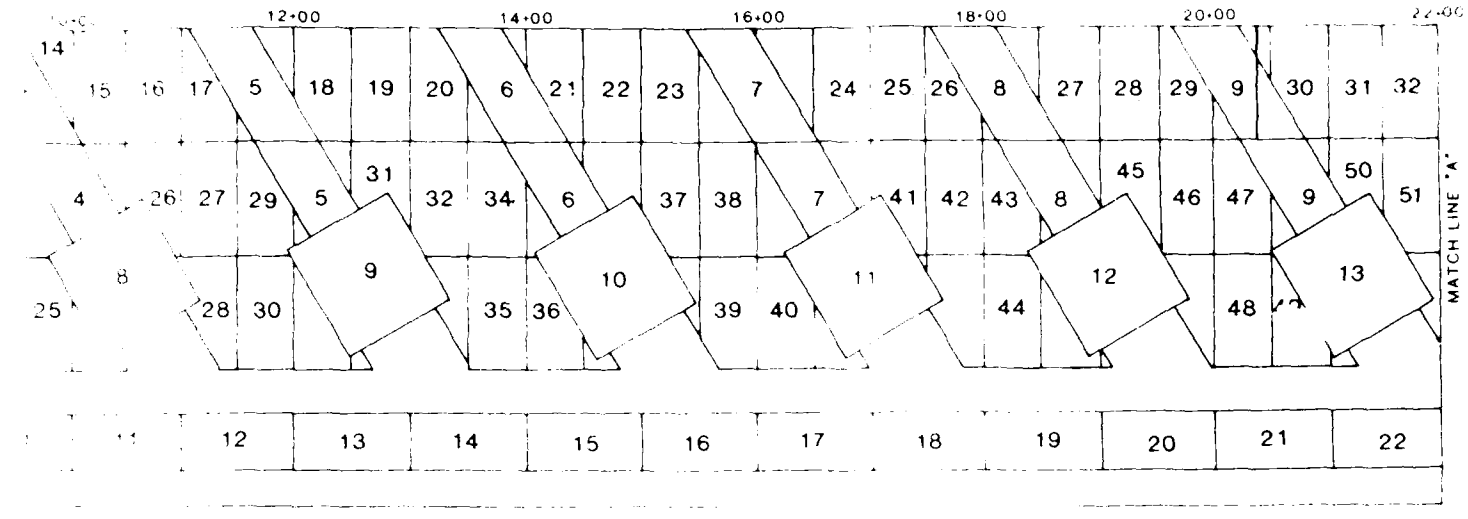
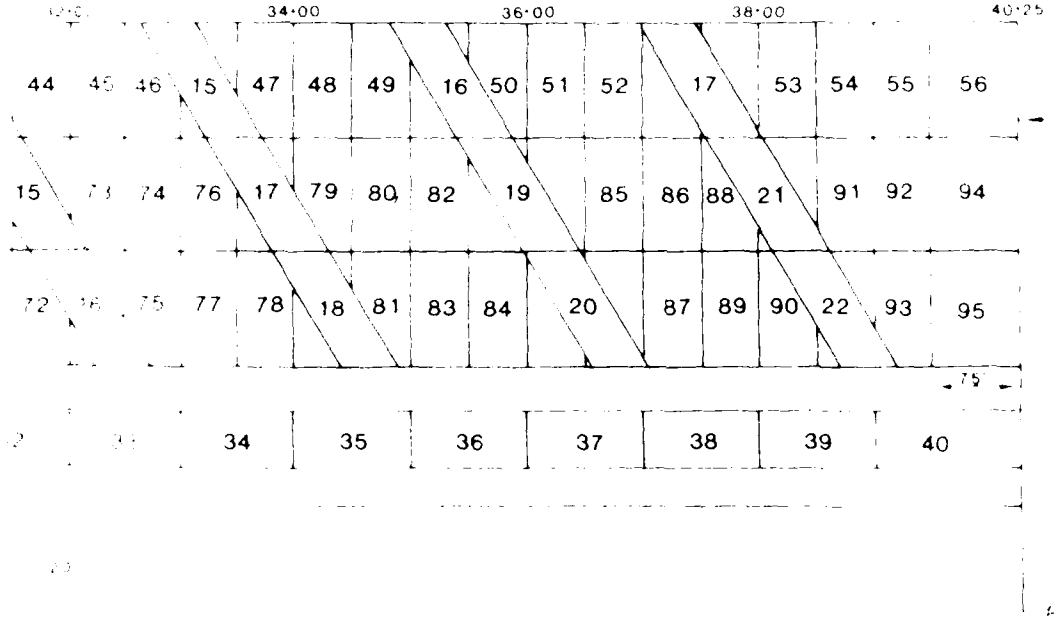


Figure 12. Surveyed sample units, Sections 3 and 4 of Features A4B and Features A7B, A8B, and A9B

- FEATURE BREAK AT 20·40





Features A4B and A5B and Section 2 of Feature A6B
A4B, and A9B

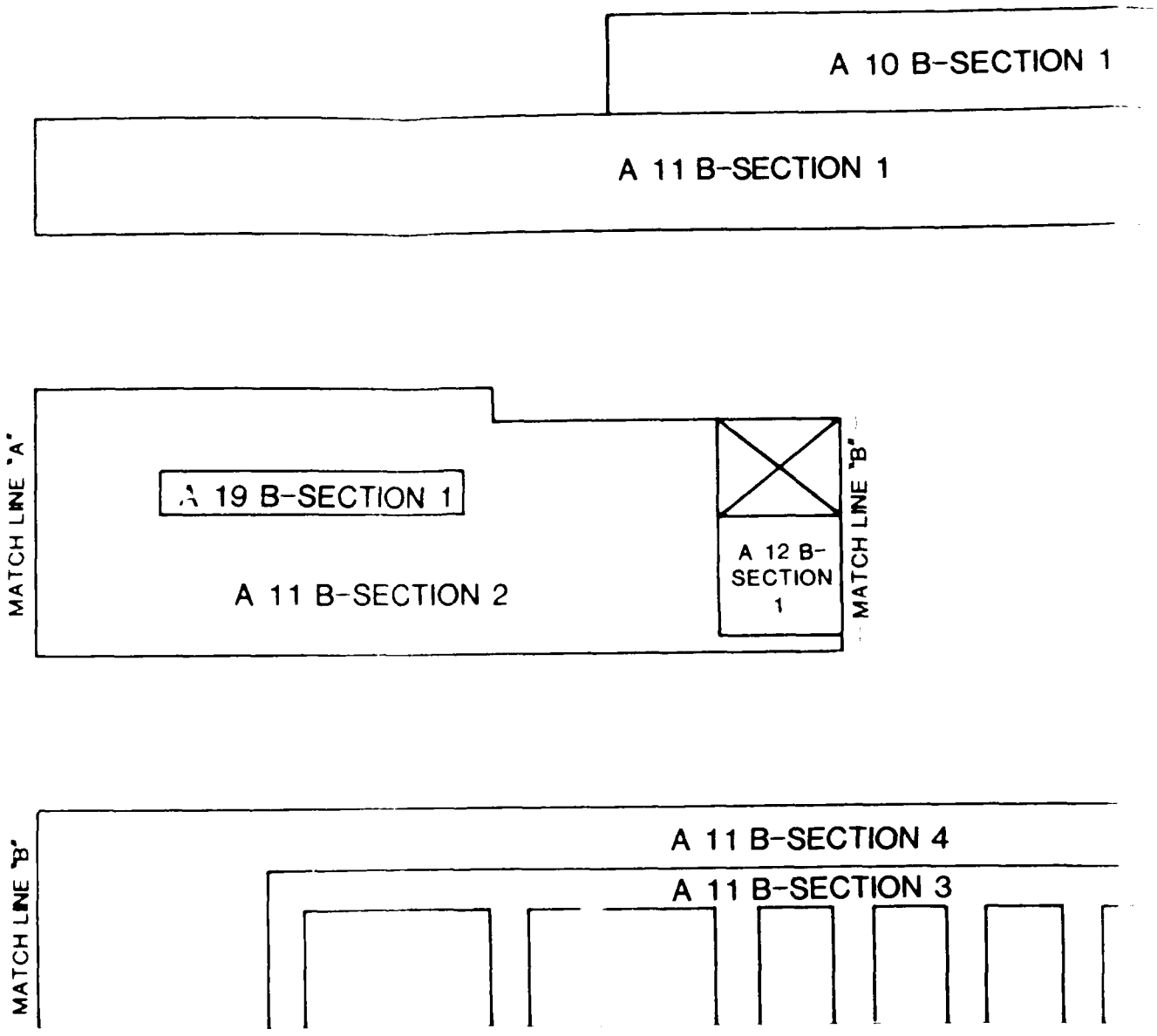
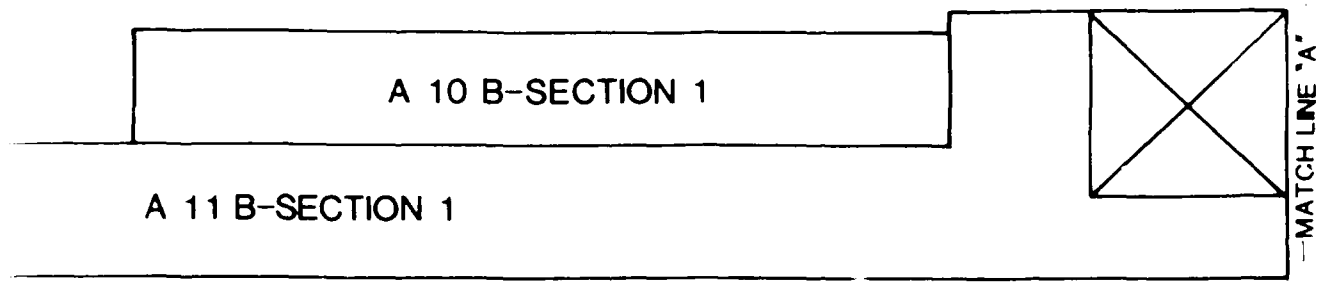
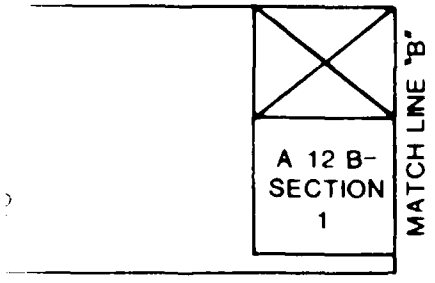
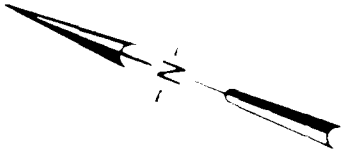
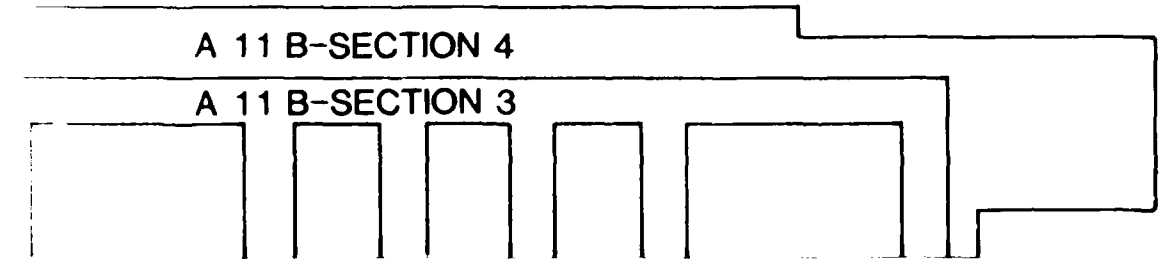


Figure 13. Section layout of Features A10B, A11B, A12B,

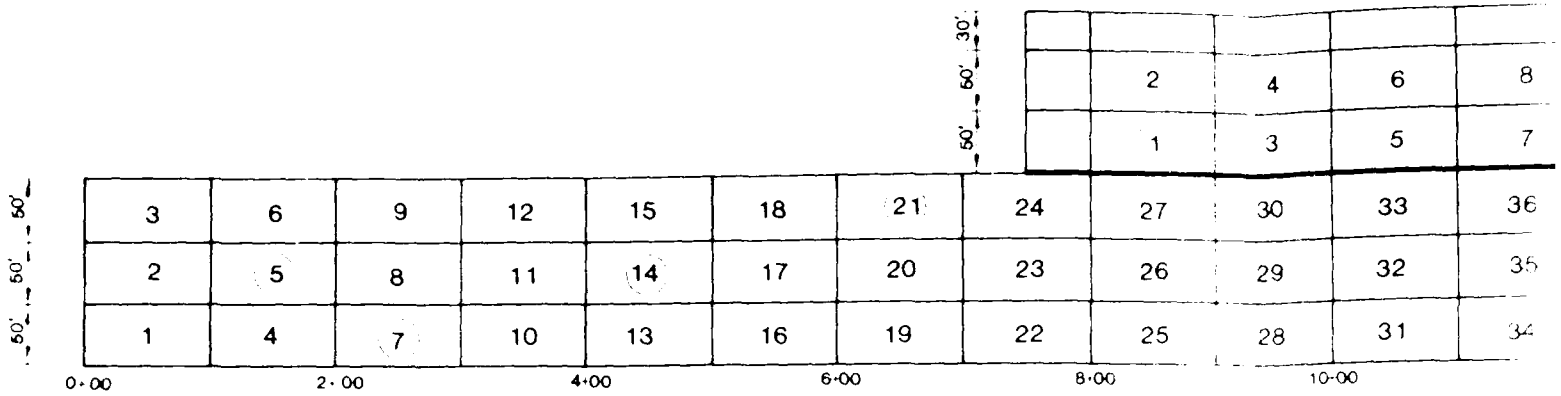


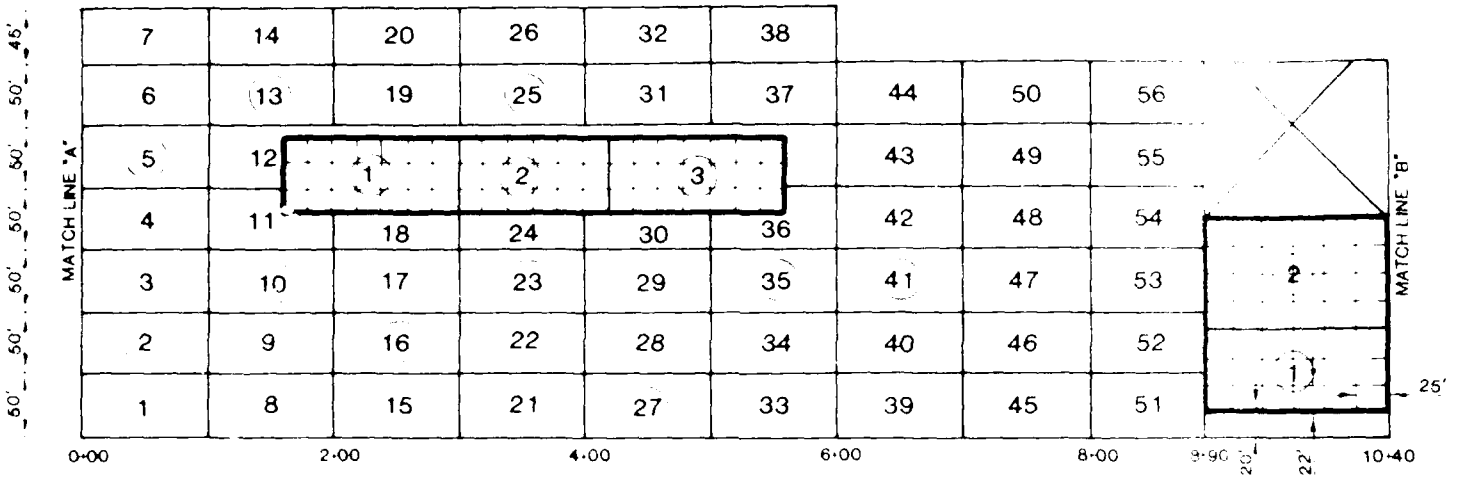


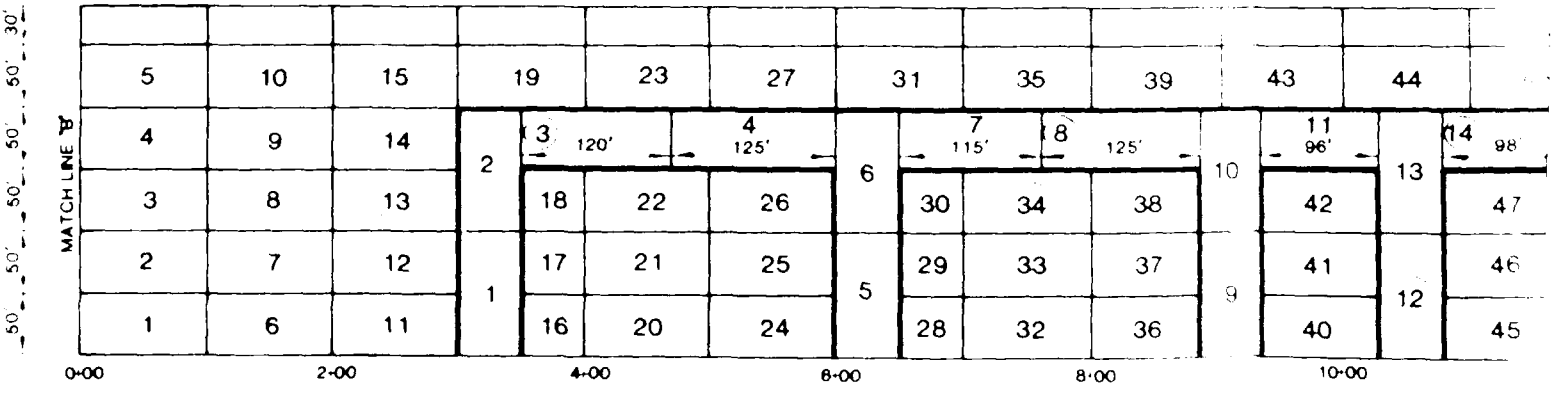




...ver layout of Features A10B, A11B, A12B, and A19B



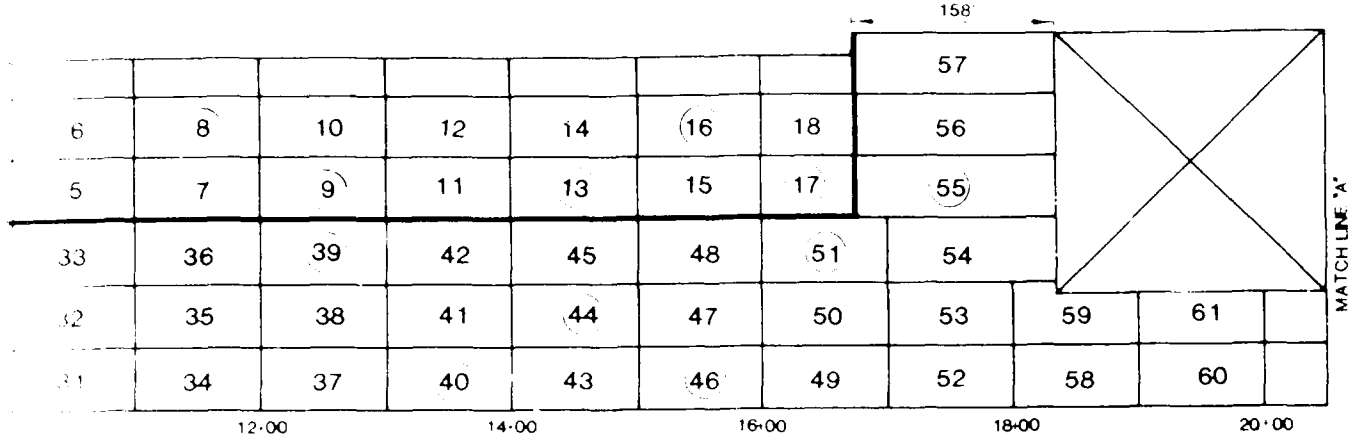


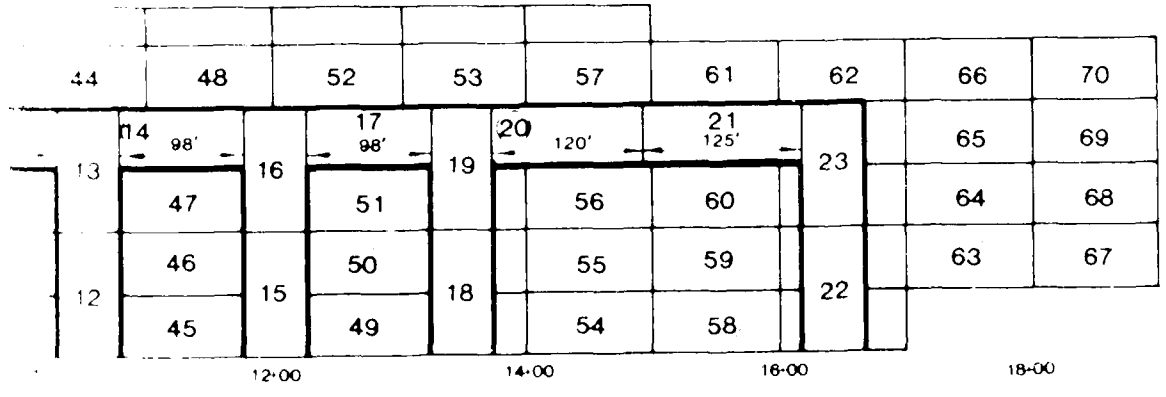


FEATURES: A10B, A11B, A12B, &

ALL
100 50 100 200

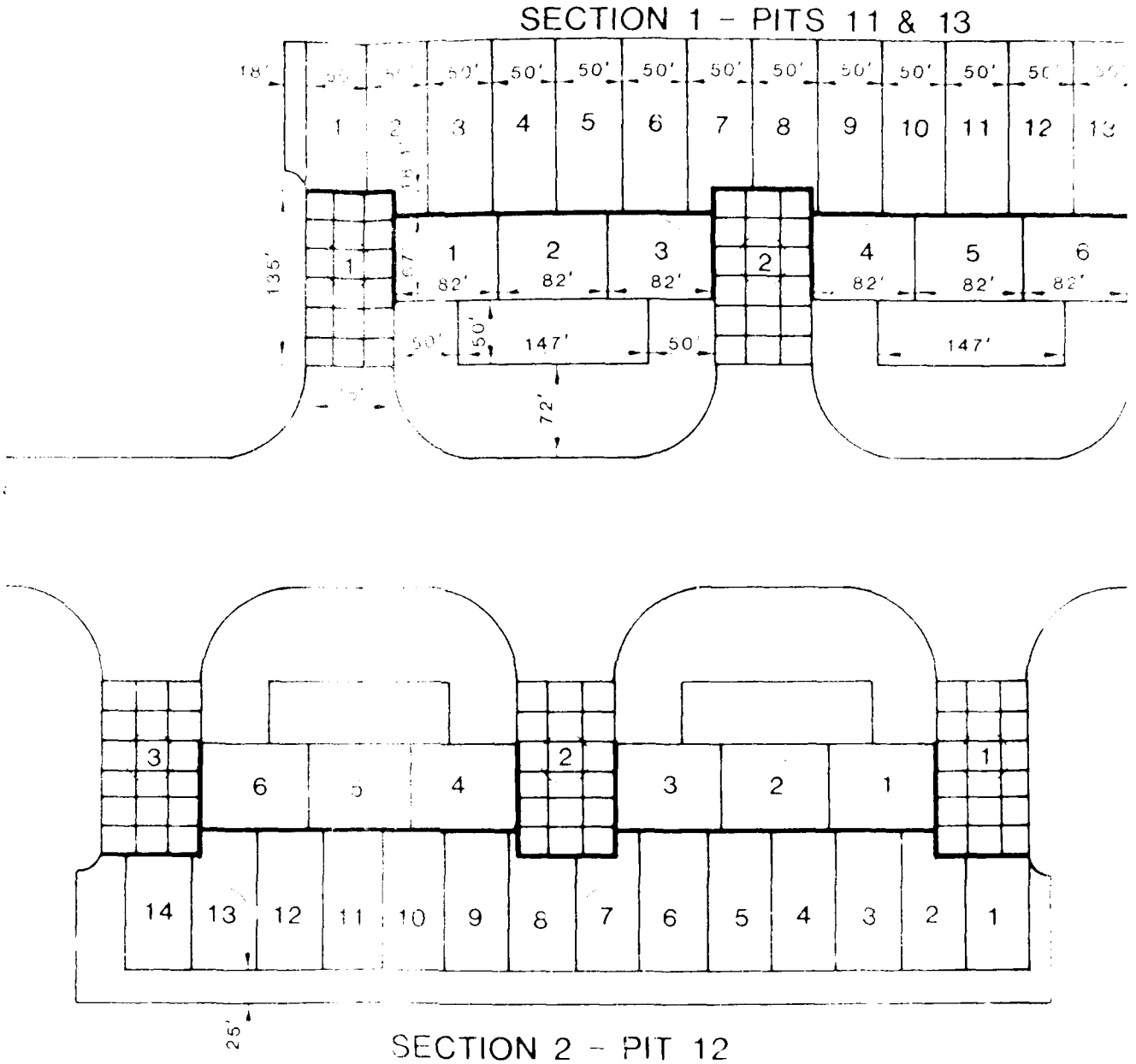
Figure 14. Surveyed sample units, features A10B, A11





1B. A12B, & A19B

200



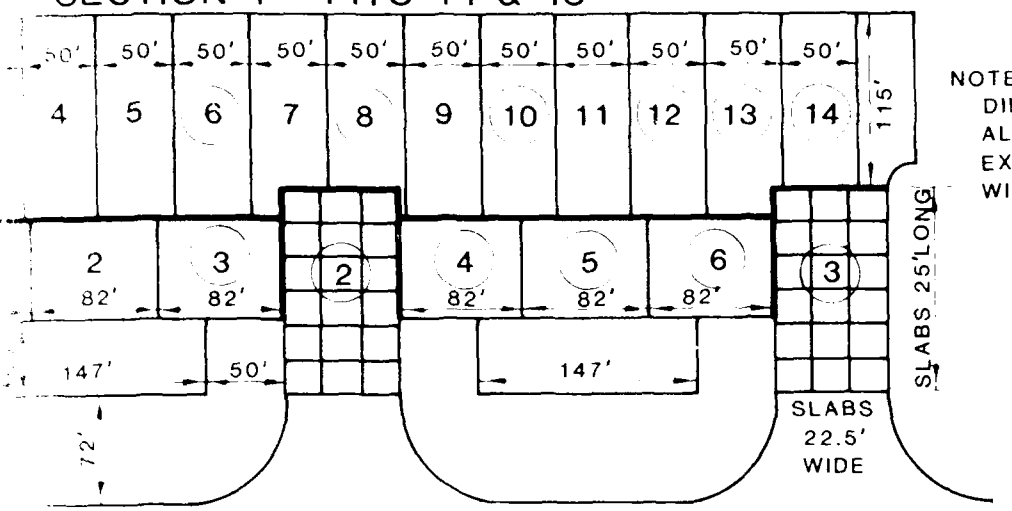
COMPLEX E -7

SCALE: 1" 100'

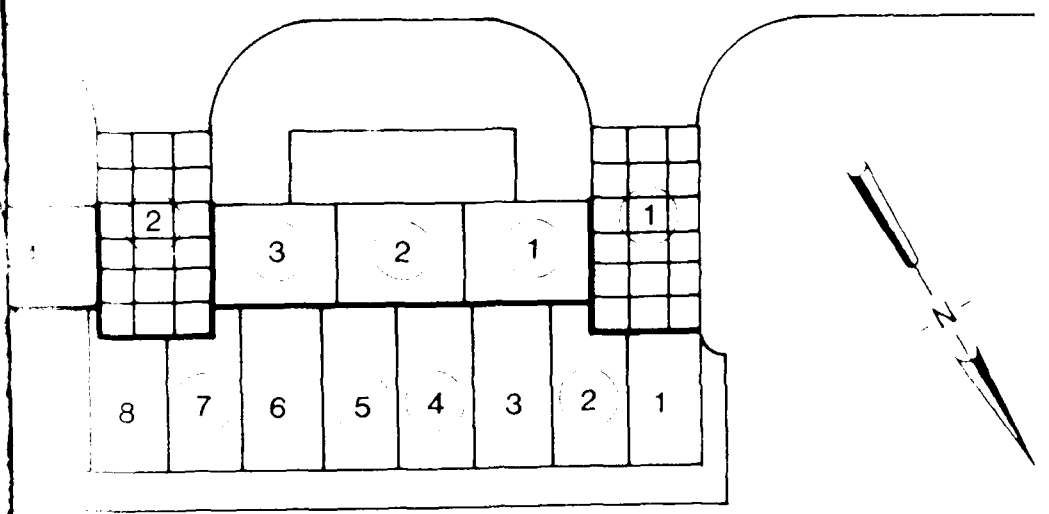
100 50 0 100 200

Figure 15. Surveyed sample units, Sections 1 and 2, Features A14B, A15B,

SECTION 1 - PITS 11 & 13



NOTE
DIMENSIONS ARE FOR ALL REFUELING AREAS EXCEPT WHERE OTHER WISE NOTED.



ON 2 - PIT 12

PLEX E -7

ALE 1" 100'

100 200

, Sections 1 and 2, Features A14B, A15B, and A16B

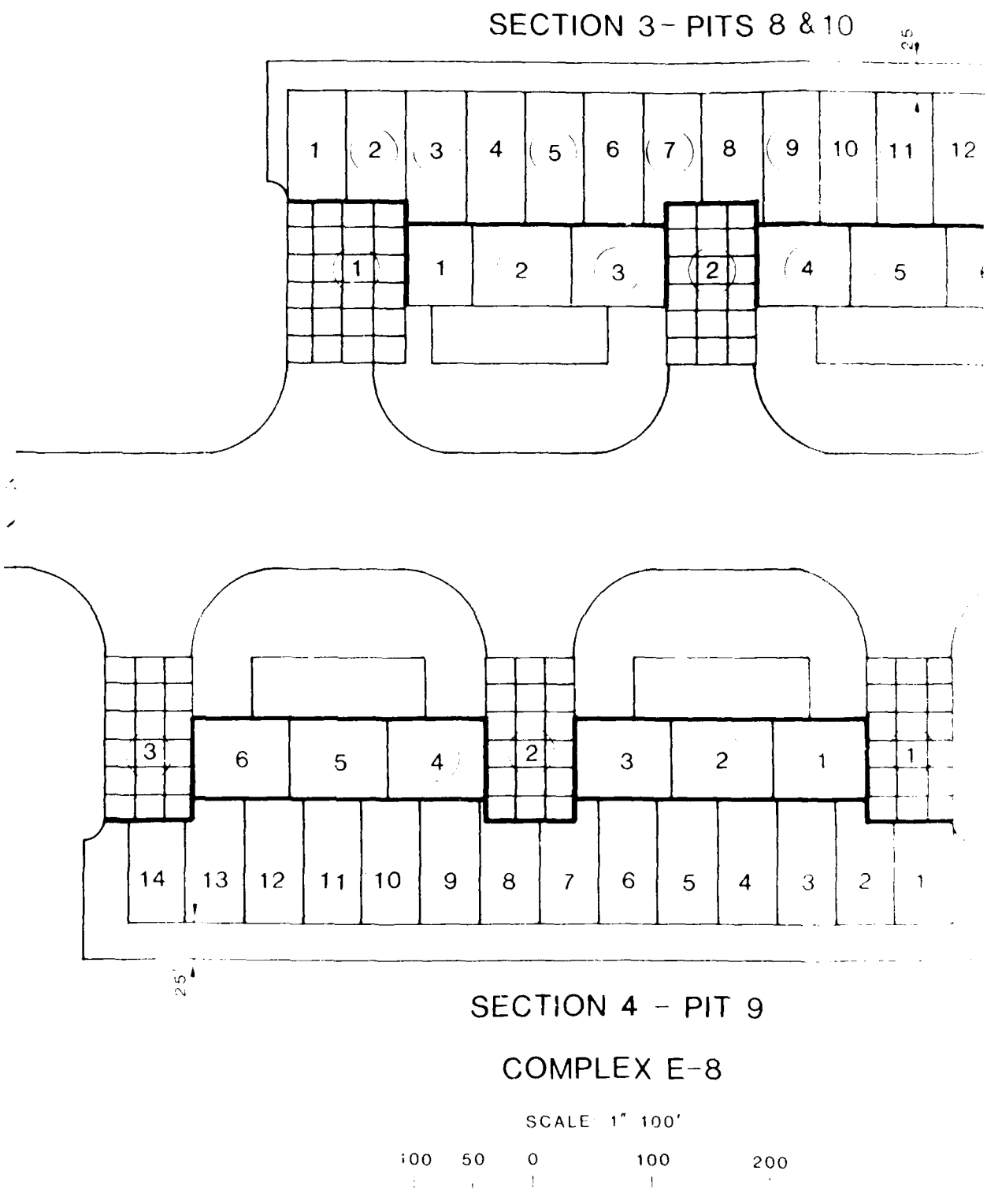
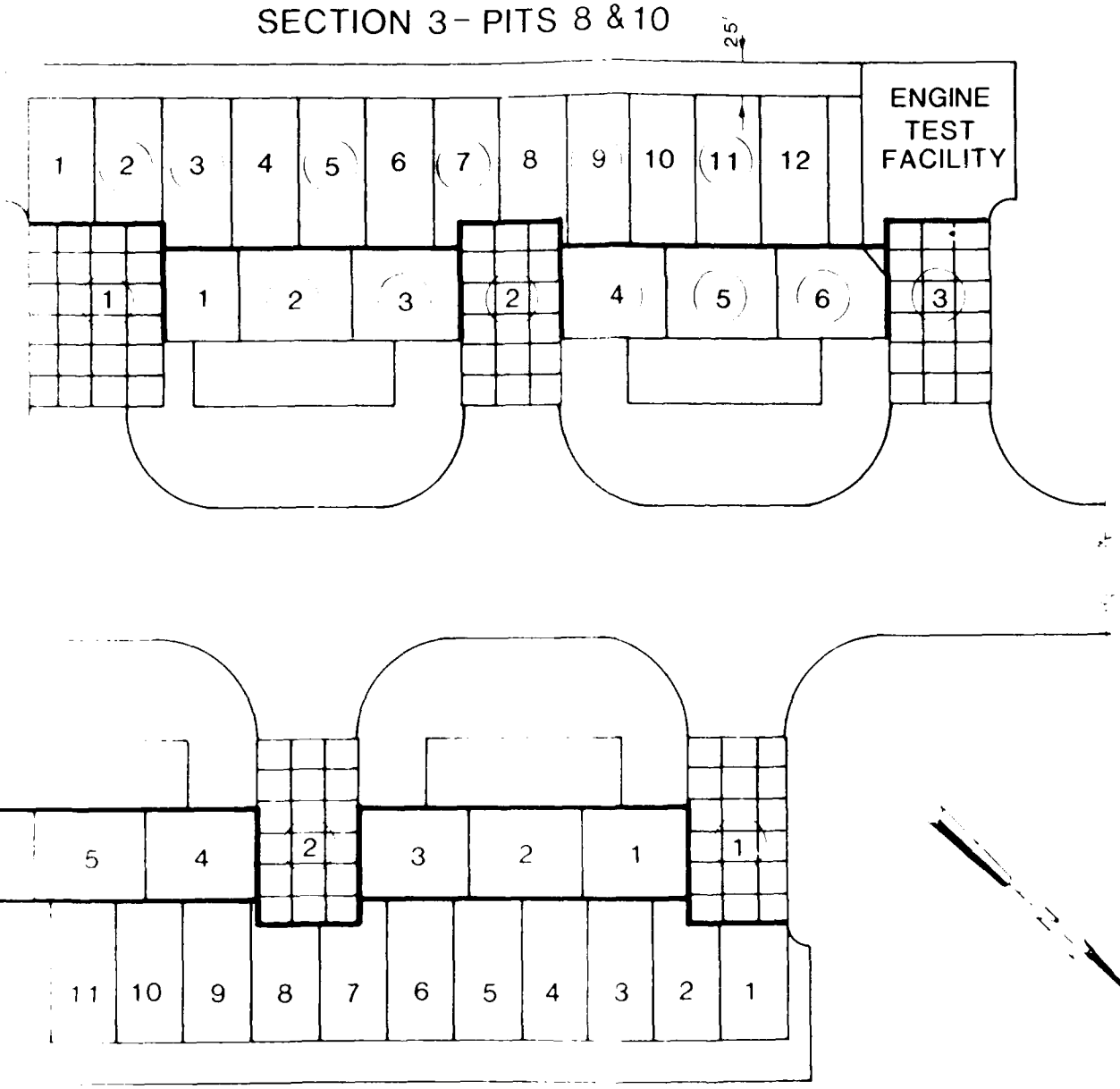
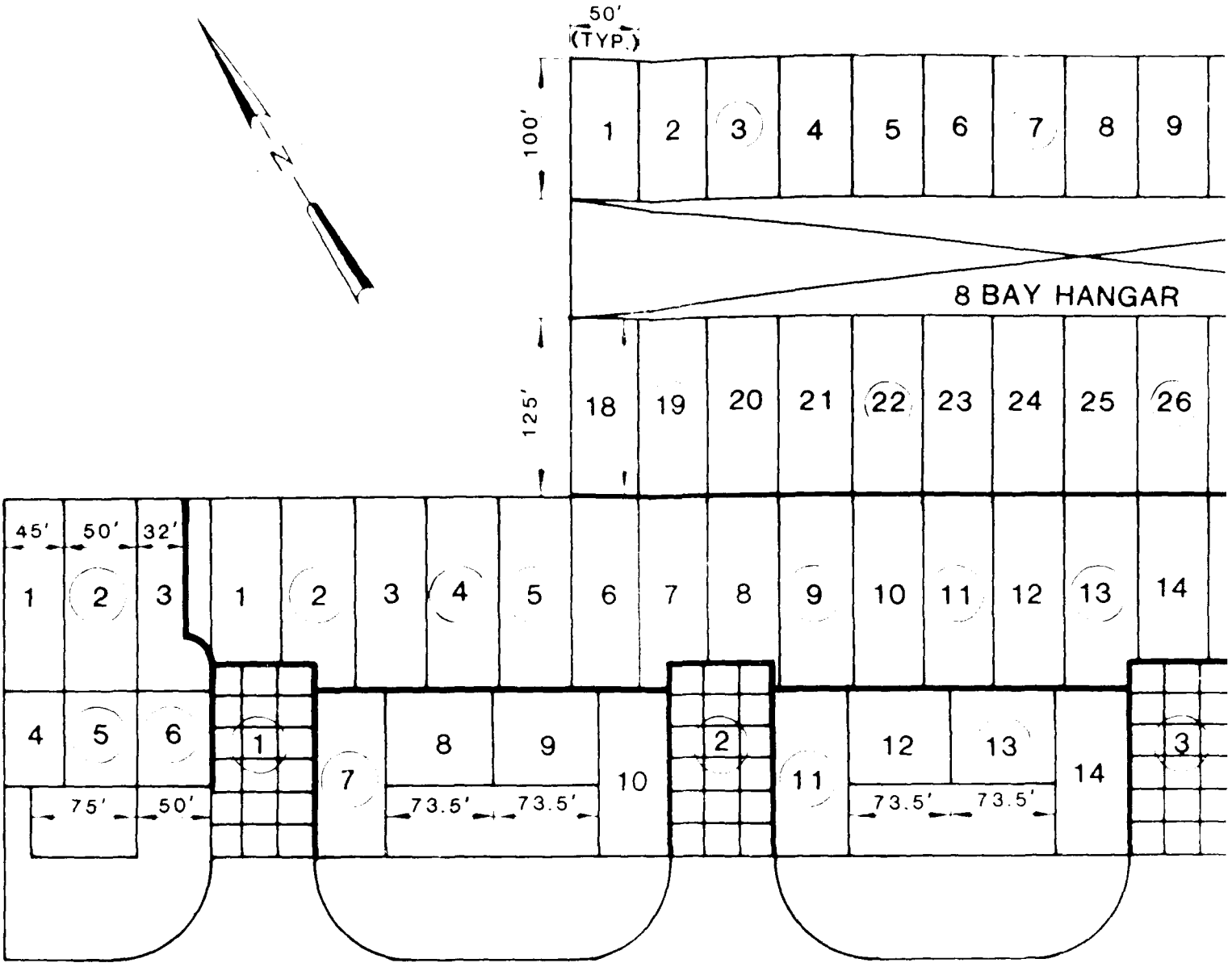


Figure 16. Surveyed sample units, Sections 3 and 4, Features A14B, A15B,



...ved sample units, Sections 3 and 4, Features A14B, A15B, and A16B



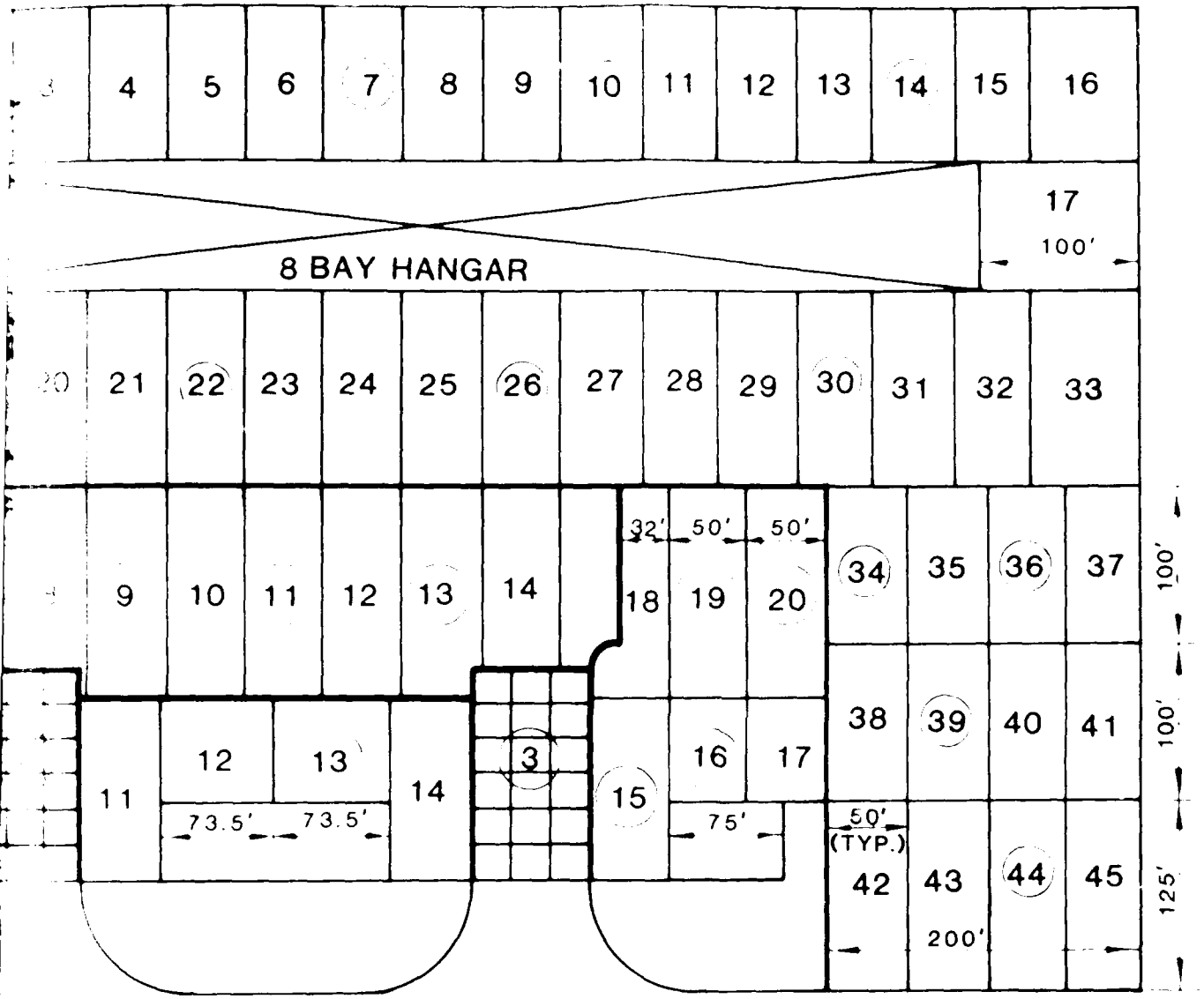
COMPLEX E - 9

SECTION 5 - PIT 6 & FEATURE A

SCALE 1" 100'

100 50 0 100 200

Figure 17. Surveyed sample units, Section 5 of Features A14B, A1[illegible]



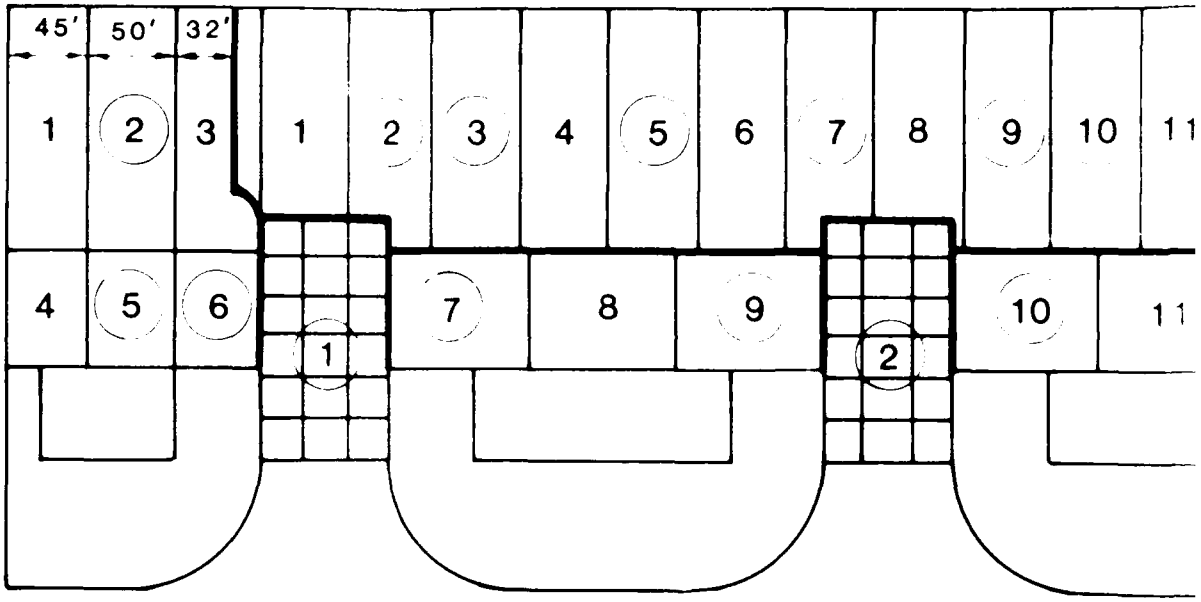
COMPLEX E - 9

ON 5 - PIT 6 & FEATURE A17B

SCALE 1" 100'

0 100 200

of Features A16B, A15B, and A16B and Feature A17B

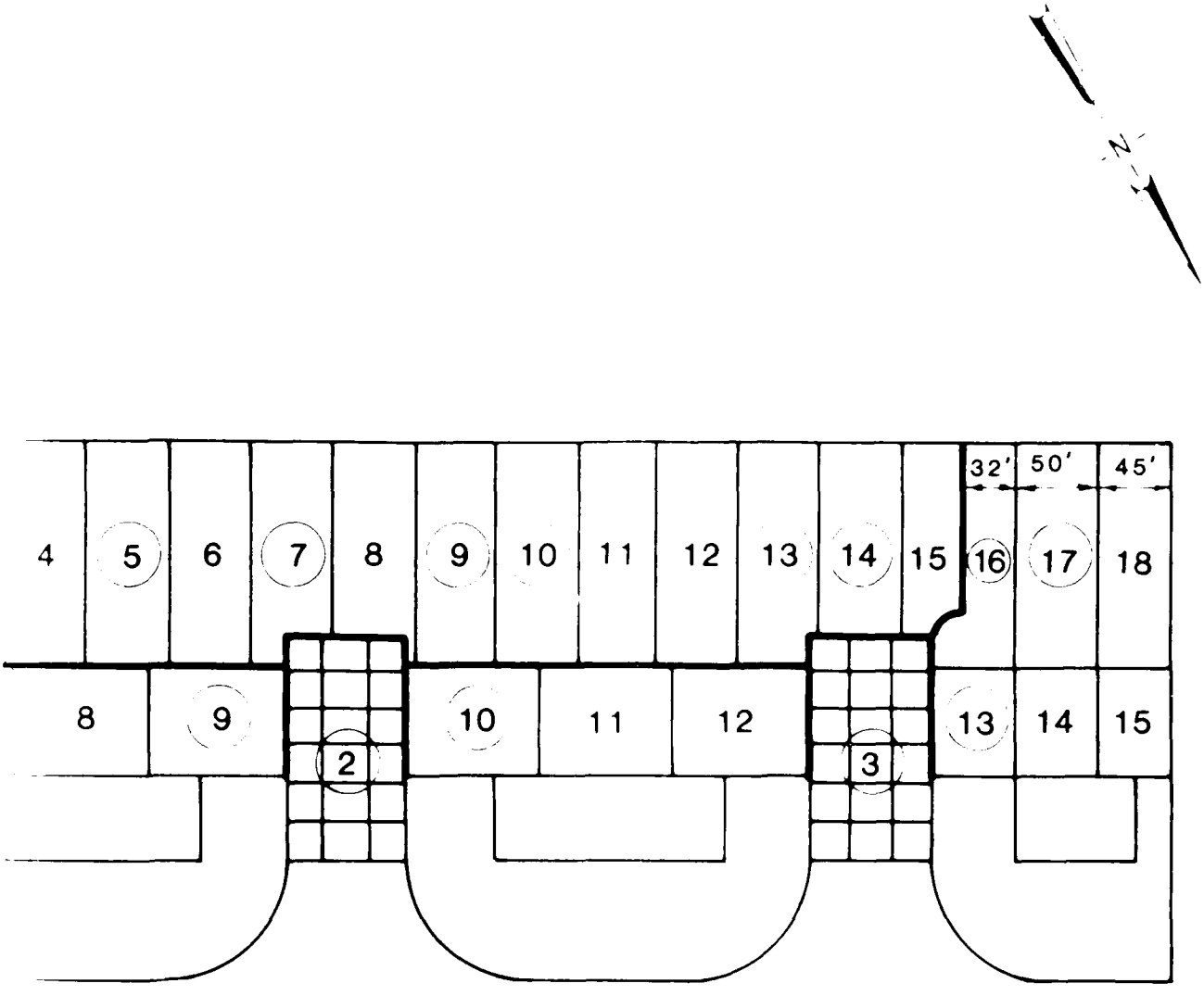


COMPLEX E-9
SECTION 6 - PITS 5 &

SCALE: 1"=100'

100 50 0 100 20

Figure 18 Surveyed sample units, Section 6, Features



COMPLEX E-9
SECTION 6 - PITS 5 & 7

SCALE: 1"=100'

100 50 0 100 200

...veyed sample units, Section 6, Features A14B, A15B, and A16B

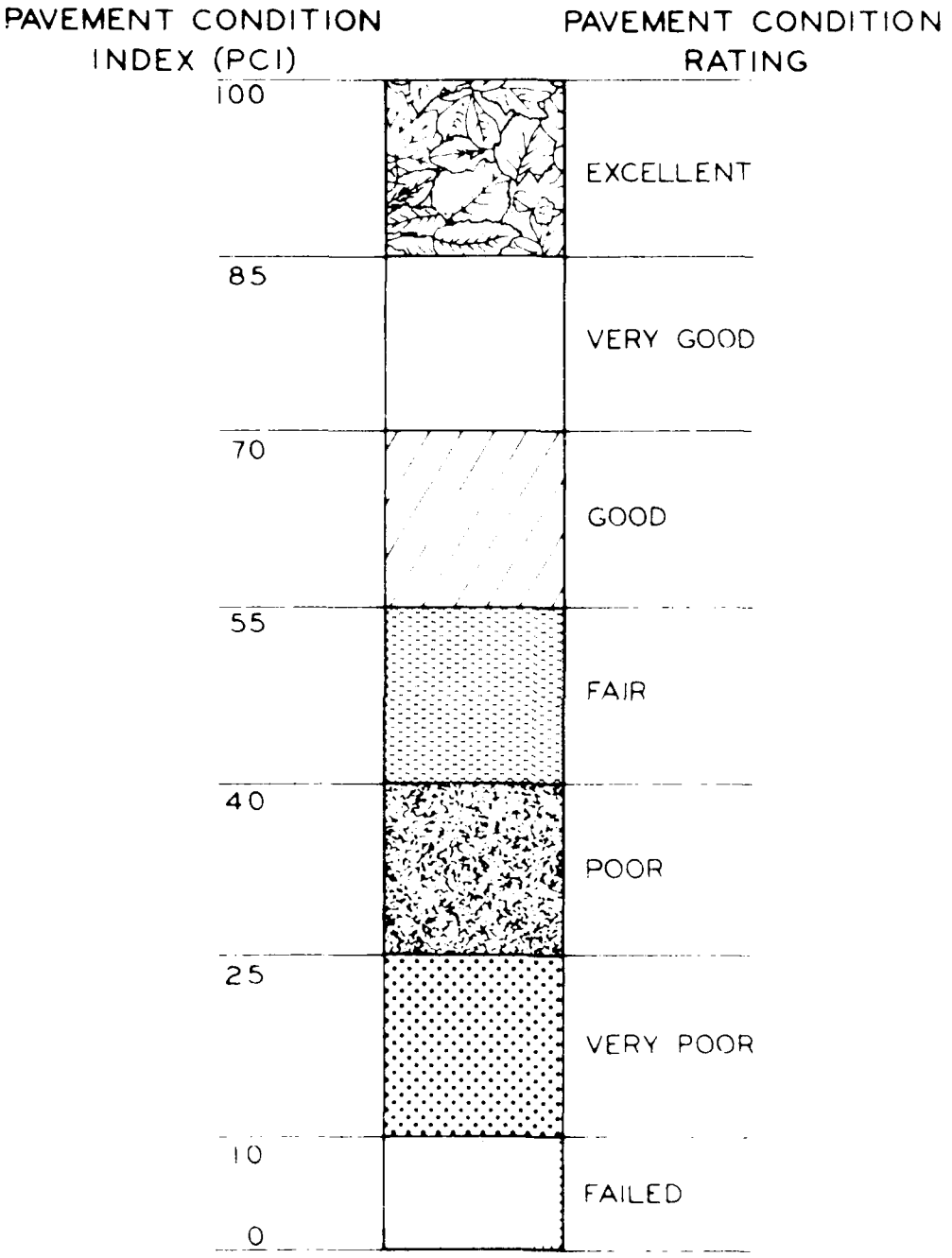


Figure 19. Pavement condition index and ratings

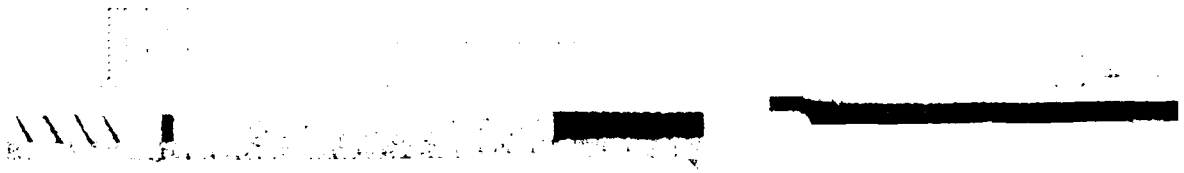
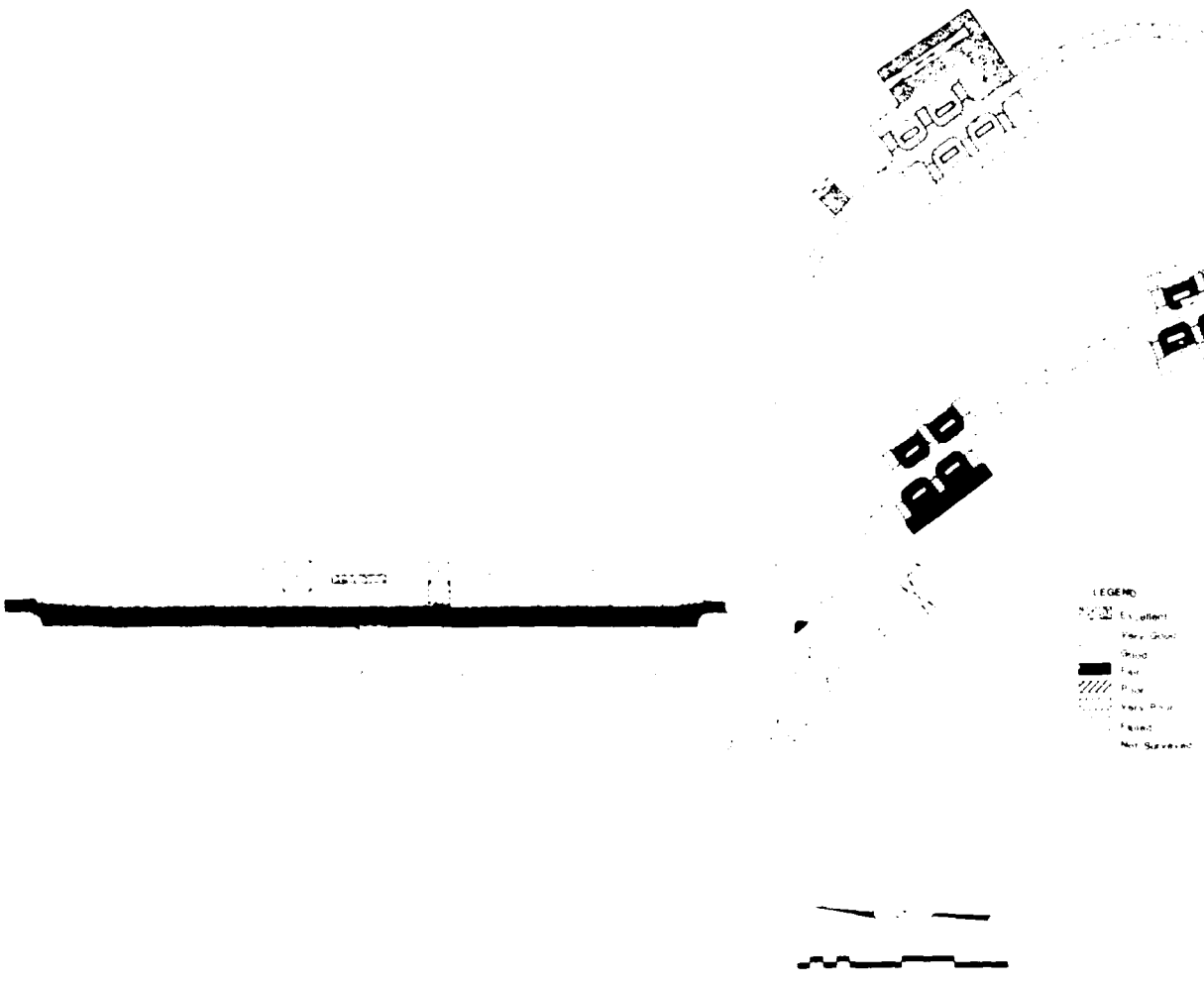


Figure 23. Pavement condition ratings at [illegible]


LEGEND

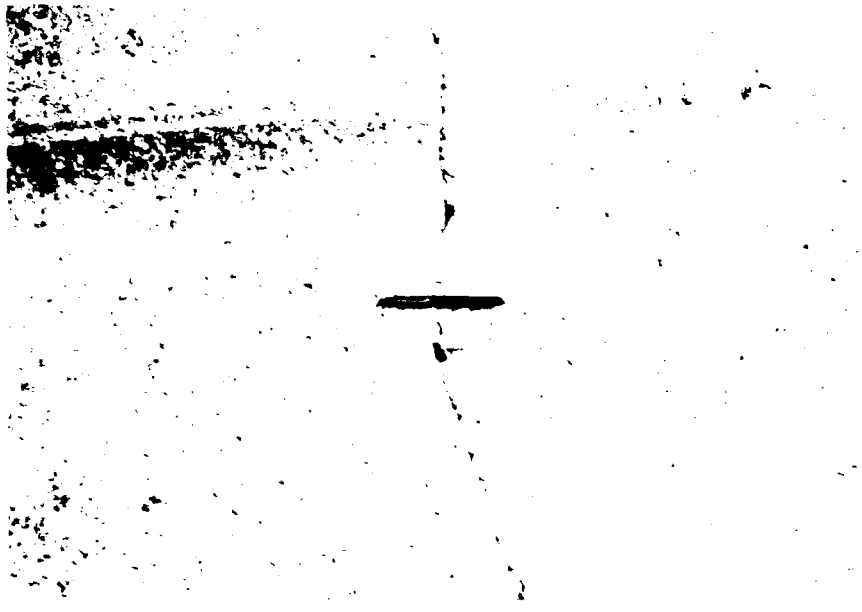
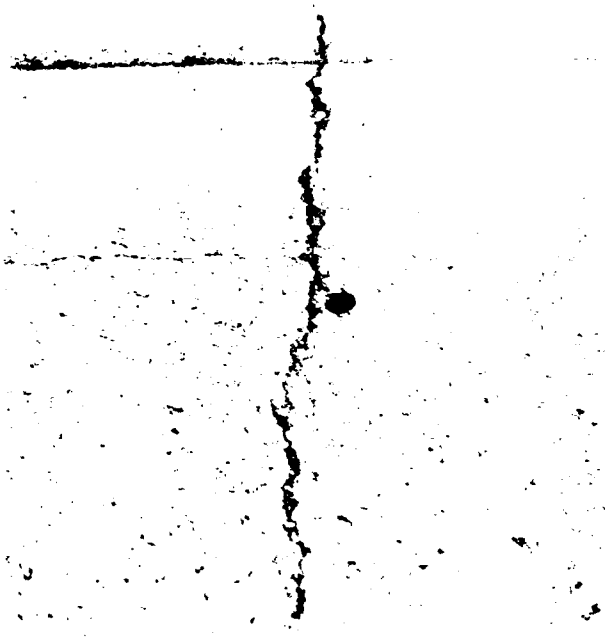
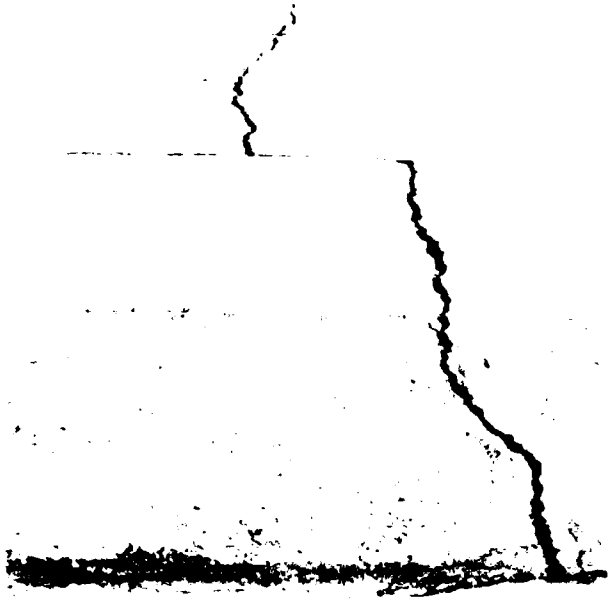
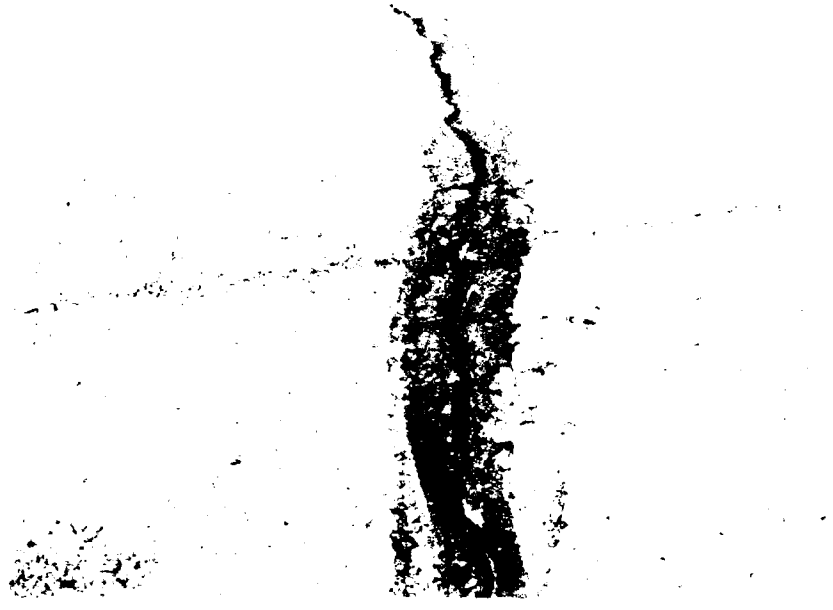


Photo 1. Typical low-severity cracking, north end of Runway 13-31

Photo 2. Freeverlay crack sealant, showing through low-severity cracking, center of Runway 14-32, north end







[illegible] View of Runway 13-31 shoulder pavement cracking [illegible] [illegible] determination of crack sealant

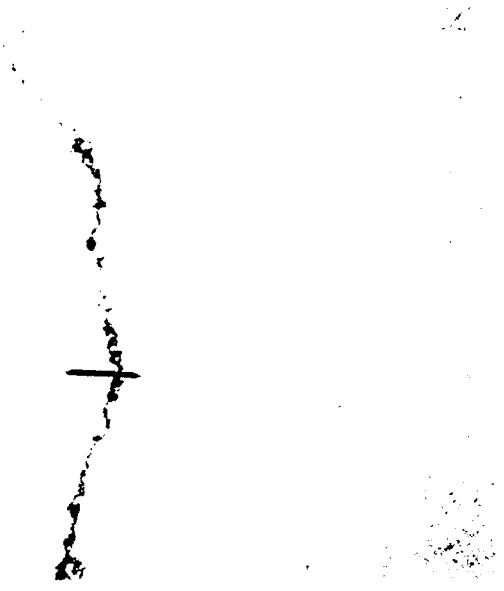
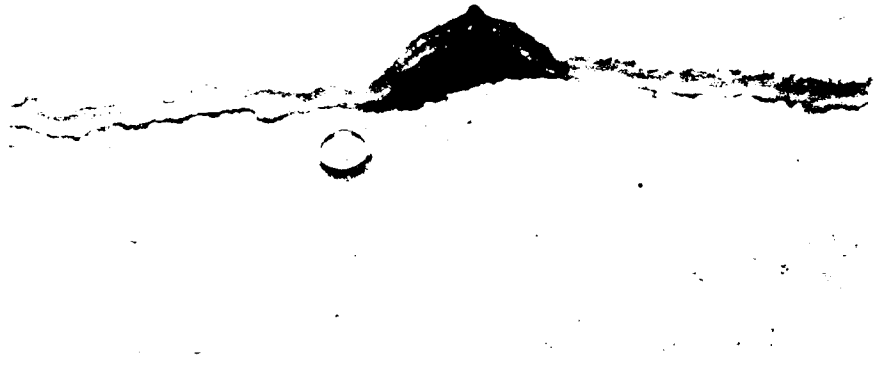


Photo [illegible] Partially routed, medium-severity crack, south end of Runway 13-31



[illegible]rly bonded crack sealant, south end of Runway 13-31

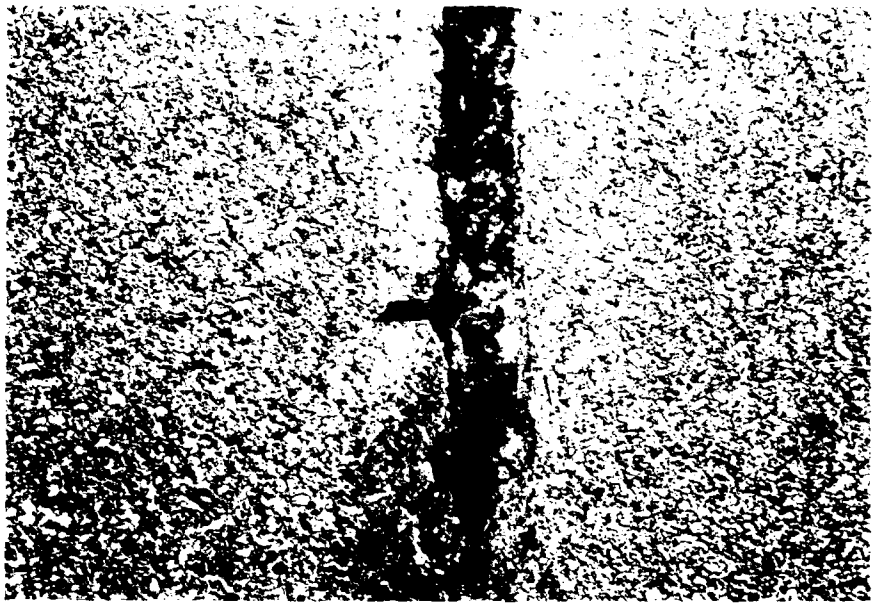


Photo 9. Typical low-severity crack, main taxiway (T2A)

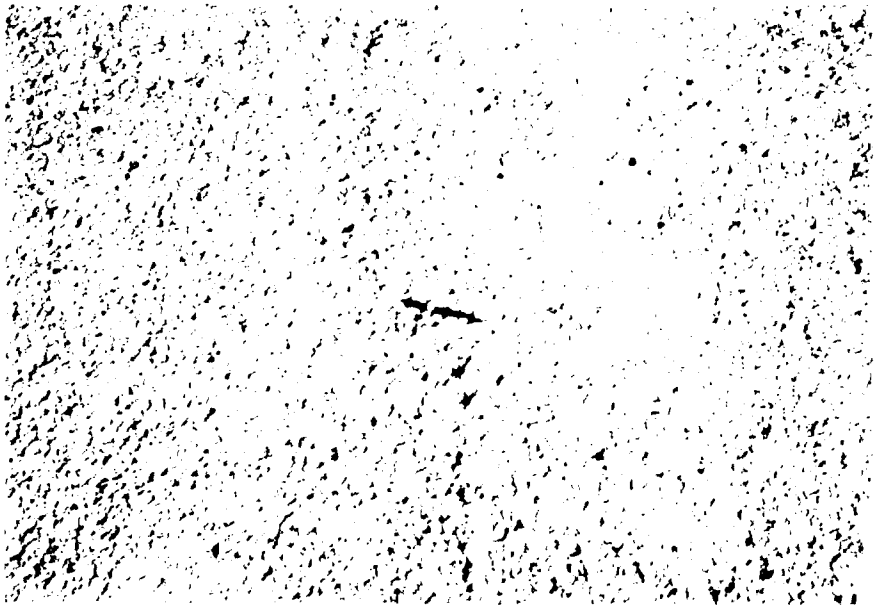


Photo 10. Typical condition of asphalt surface, main taxiway (T2A)

Photo 11. Surface condition showing high-severity depressions in Feature T10C, Section 2

Photo 12. High-severity cracking and depression, main taxiway (T12C)

Photo 13. Typical unsealed, low-severity cracking, main taxiway (T13A)

Photo 14. Bleeding, main taxiway (T13A)

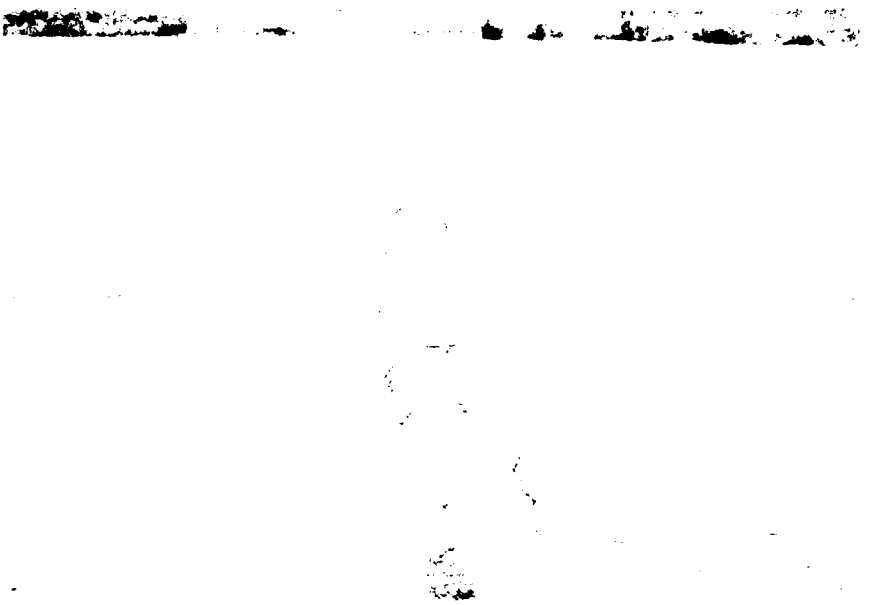


Photo 15. Medium-severity transverse cracking, exhibiting subsidence, Taxiway 2 (T6C)

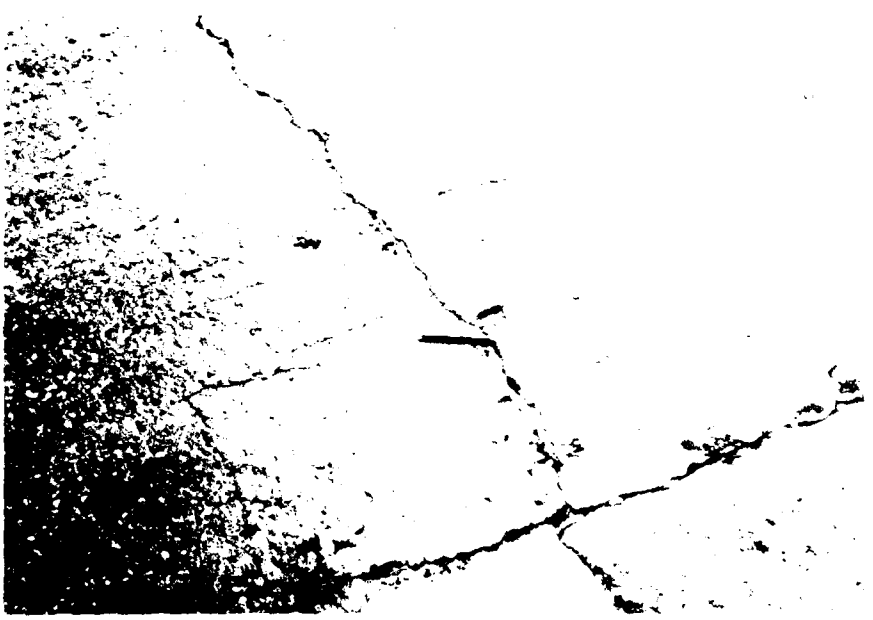


Photo 16. Low-severity cracking and general condition of asphalt surface, Taxiway 4 (T17C)

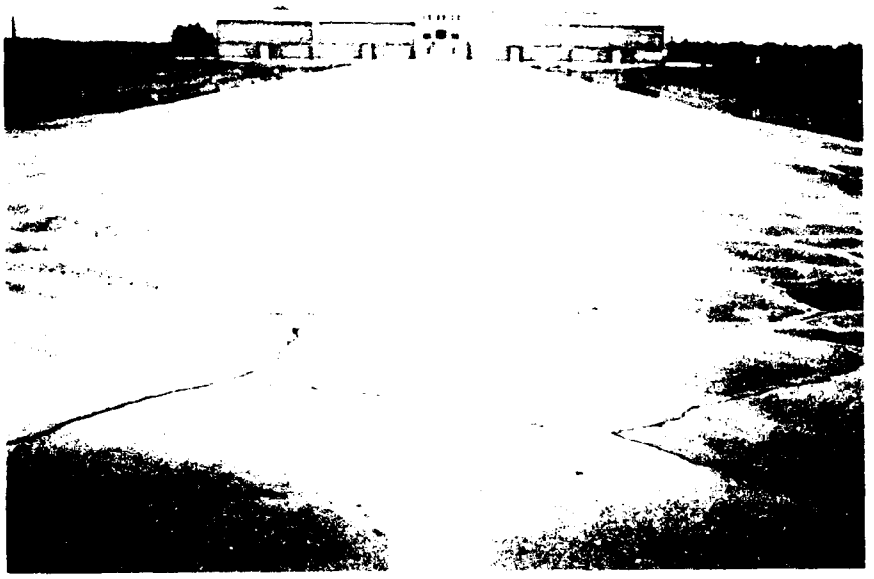


Photo 17. General view of surface cracking, alert area access taxiway (T22A)

Photo 18. General view of loop taxiway (T23A) showing typical cracking

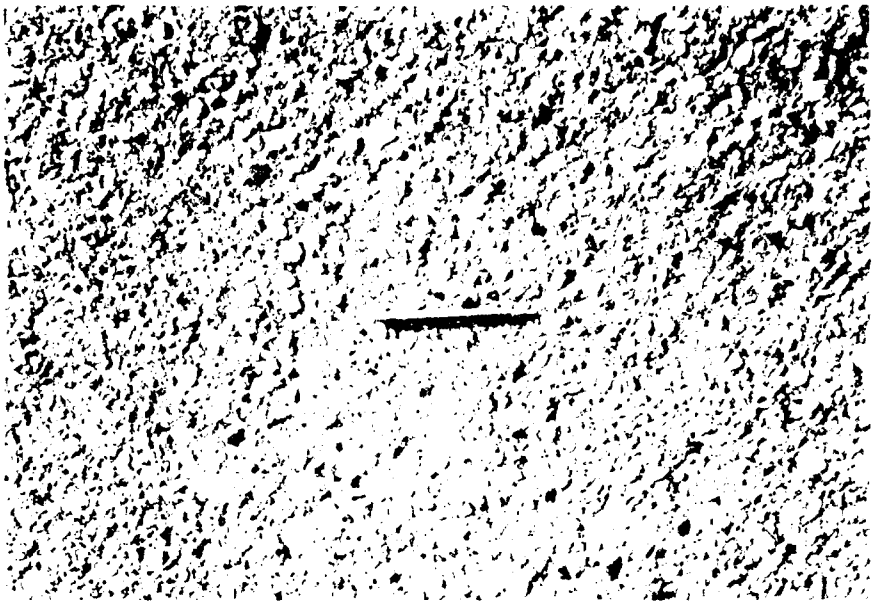


Photo 19. Close-up of asphalt surface, loop taxiway (T23A

Photo 20. Typical shattered slab, Nose Docks 1 and 2 Apron (A1B)

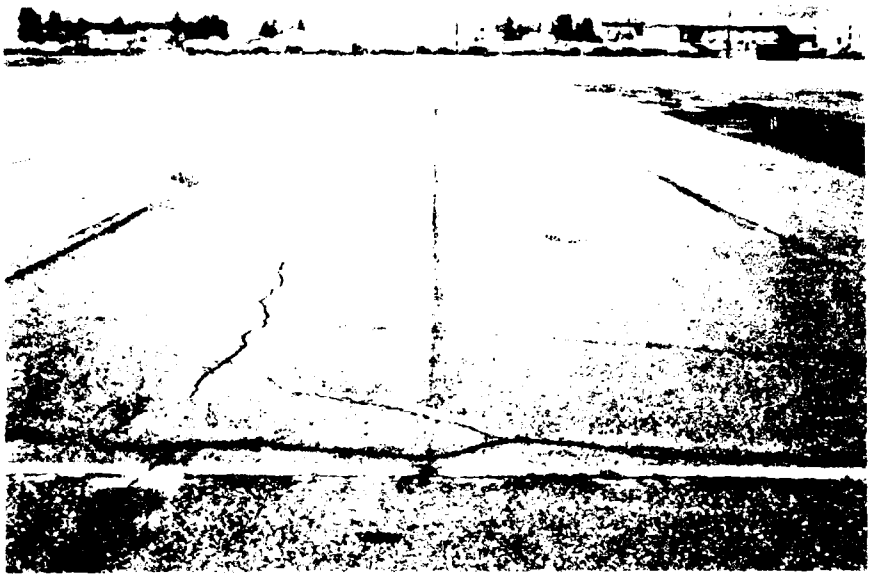


Photo 21. Overall view of tar-rubber overlay, SAC apron (A2B) (Note the weathering in the rightmost paving lane)

Photo 22. Low-severity cracking in recent AC overlay, C-135 apron (A6B)

Photo 23. Typical unsealed, high-severity cracking, C-135 apron

Photo 24. Faulted high-severity crack, C-135 apron

Photo 25. Oil spillage, C-135 apron (A9B)

Photo 26. Sealed low-severity cracking in original PCC pavement, C-135 parking pads (A7B)

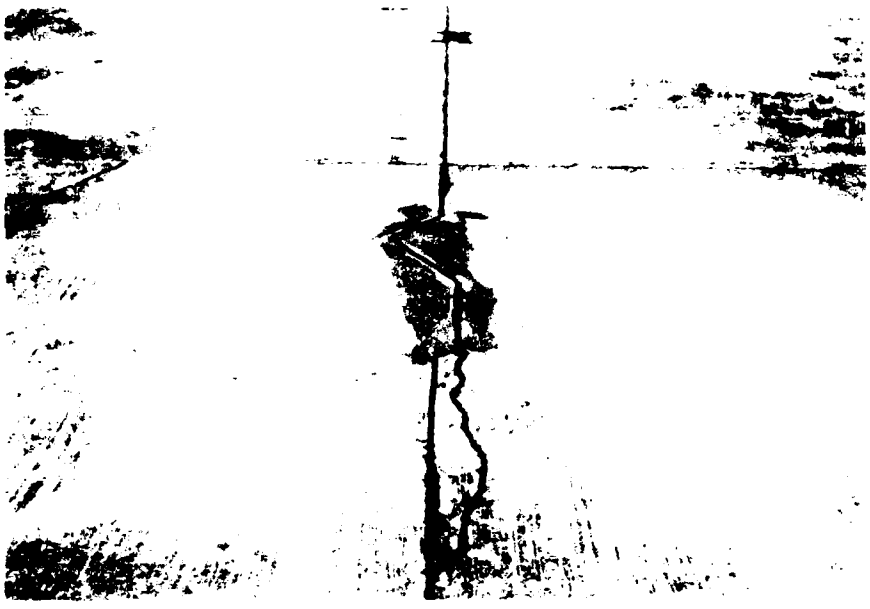


Photo 27. Repaired joint, original PCC pavement, C-135 parking pads (A7B)

Photo 28. Low-severity joint spall, PCC pavement addition, C-135 parking pads (A7B)

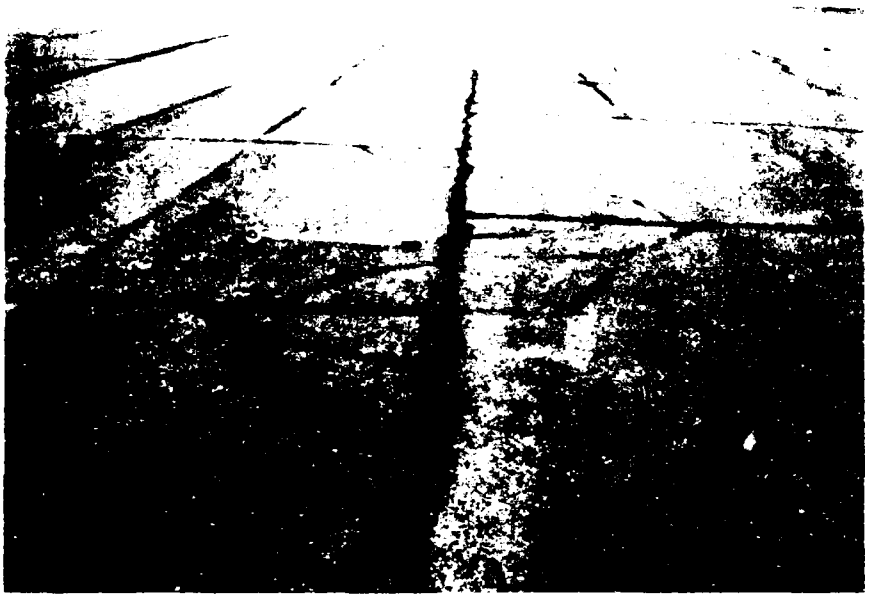


Photo 29. Block cracking exhibiting corner breaks, south apron (A11B)

Photo 30. General view of fuel pit area and low-severity rutting, south apron (A11B, Section 3)

Photo 31. Low-severity shattered slab, alert area apron (A13B)

Photo [illegible]. High-severity [illegible] apron (A14B)

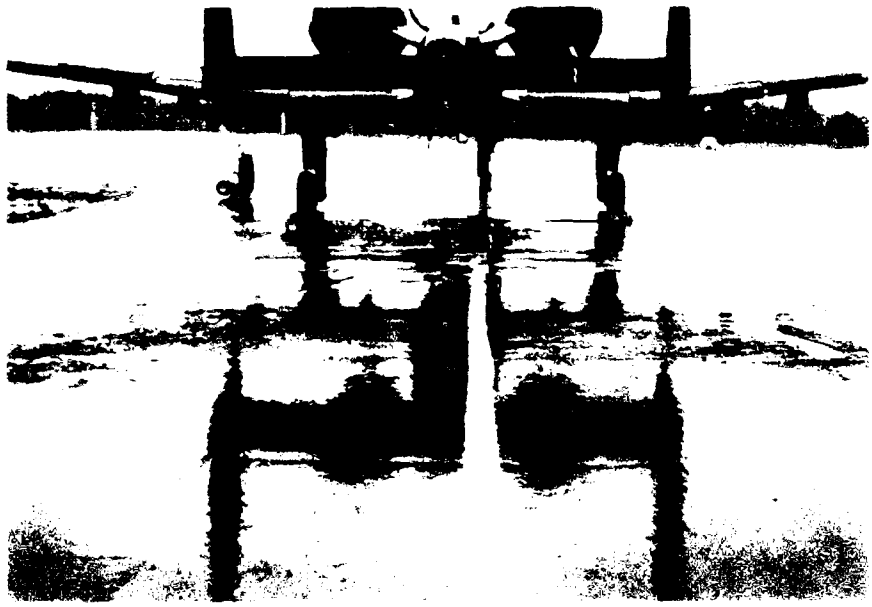


Photo 33. View of A-10 aircraft parking pad, refueling pit apron (A10B)